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THE ARABIC LITERATURE ON ALCHEMY ACCORDING TO
AN-NADĪM (A.D. 987).

A Translation of the Tenth Discourse of *The Book of the Catalogue*
(AL-FIHRIST) with Introduction and Commentary.

By J. W. FÜCK.

PREFACE.

THE famous Book of the Catalogue (*Kitāb al-Fihrist*), written by ABŪ-L-FARAJ MUHAMMAD IBN ISHĀQ AN-NADĪM in A.H. 377–8, deals in its Tenth and last Discourse (*maqāla*), which the reader will find translated in the following pages, with the Alchemists both ancient (*i.e.*, of pre-Islamic times) and modern (*i.e.*, living under Islam), and their writings¹.

The twenty-five Sections, or paragraphs, of which this Discourse consists, have the following contents :

§ 1. On the Origin and Importance of Alchemy.

§ 2. On its so-called Inventor, HERMES, and his Tomb, the Great Pyramid.

¹ An English translation of the Preface of the *Fihrist* (together with a summary of its contents) is given by E. G. Browne in his *Literary History of Persia*, i, 383–7.

- § 3. A Narrative of an Ascent of the Great Pyramid ; on the Egyptian Temples, and on Hermetic Literature in general.
- § 4. The Writings of HERMES on the Art (Alchemical *Hermetica*).
- § 5. OSTANES.
- § 6. ZOSIMOS.
- § 7. A list of 52 Alchemists, both ancient and modern.
- § 8. KHĀLID IBN YAZĪD, the earliest Arabian Alchemist.
- § 9. A list of Books containing 45 titles of Alchemical works, mostly ascribed to pre-Islamic Authors.
- § 10. JĀBIR IBN HAYYĀN (GEBER).
- § 11. His Pupils.
- § 12. His Writings (*i.e.*, a list of about 300 book-titles).
- § 13. DHŪ N-NŪN.
- § 14. AR-RĀZĪ (RHASES).
- § 15. IBN WAḤSHĪYA.
- § 16-§ 24. Nine short articles on lesser Arabian Alchemists down to AN-NADĪM'S time, with the titles of their works.
- § 25. Final remarks on Alchemy and its Origin.

The Arabic text of the *Fihrist* was published together with annotations, by Gustav Flügel². A reprint of this edition appeared in 1930 at Cairo³. A French translation of the Tenth Discourse (omitting, however, the section on the Pyramids) was published in 1893, on the basis of Flügel's text, by O. Houdas in Marcelin Berthelot's monumental work *La Chimie au Moyen Âge*⁴. Translations of single sections will be mentioned in the Commentary (pp. 109-144).

Flügel, in editing the text of the Tenth Discourse, had at his disposal only those MSS. which were then known in European libraries, viz. :

L = Leyden, No. 20 Dozy,
C = Paris, Suppl. arabe 1400,
H = Vienna, No. 33 Flügel,
V = Vienna, No. 34 Flügel.

As soon as the libraries of Stamboul became accessible, H. Ritter⁵ was able to show that these four manuscripts (with the possible exception of L) are derived, directly or indirectly, from two manuscripts in Stamboul libraries, viz. :

S = Shahīd 'Alī Pasha, MS. no. 1934,
K = Köprülü, MS. no. 1135.

I have utilized these two manuscripts in photographs which Professor H. Ritter

² *Kitāb al-Fihrist*. Mit Anmerkungen herausgegeben von Gustav Flügel, nach dessen Tode besorgt von Johannes Rödiger und August Müller, Leipzig, 1871-2, 2 vols.

³ *al-Fihrist li-Ibn an-Nadīm*, Miṣr A.H. 1348.

⁴ M. Berthelot, *La Chimie au Moyen Âge*, Paris, 1893, iii, 26-40.

⁵ 'Zur Ueberlieferung des Fihrist', *Der Islam*, 1928, xvii, 15-23.

was good enough to send me. I have taken the readings of L from Flügel's edition. Whilst preparing a new edition of the *Fihrist*, I sent in 1930 jelly-typed copies of the Arabic text of the Tenth Discourse with a translation and notes to Doctors (†)Max Meyerhof, Martin Plessner, Hellmut Ritter, and (†) Julius Ruska and received from them some valuable emendations and other suggestions; what I owe to each of these scholars is mentioned in the following pages under his respective name, and I gladly avail myself of this opportunity of expressing my grateful acknowledgement. Last, but not least, I offer my heartiest thanks to Dr. H. E. Stapleton, whose keen interest in Arabic Alchemy and kind encouragement prompted me to take up my work again, and who has very kindly gone through my manuscript and made many helpful suggestions.

INTRODUCTION.

1. *The Author.*

Of the author of the *Fihrist* very little is known beyond the information we can gather from his work. His full name was ABŪ L-FARAJ MUḤAMMAD IBN ISḤĀQ AN-NADĪM. The surname AN-NADĪM, 'the boon companion', may mean that he was, for some time, the companion of one of the great men of the tenth century; but as he is generally referred to as IBN AN-NADĪM, 'the boon companion's son', it is equally possible that the surname refers to one of his ancestors. His father, ABŪ YA'QŪB ISḤĀQ, was a copyist or bookseller (*warrāq*), and though his son's profession is nowhere stated, it is evident from the character of his work that he too was a bookseller. For, here, in his *Fihrist*, we find enumerated nearly all the books in the Arabic language and script that were, in his days, to be found in the book-market of Bagdad; not only the writings of the learned and divines, poetry and belles-lettres, but also anonymous novels, fairy-tales, love-stories, fables, and even cookery-books, books on husbandry and the like.

2. *AN-NADĪM's Sources.*

We may safely assume that AN-NADĪM had actually seen most of the works which he included in his *Catalogue*. Occasionally, however, he states that he had obtained his information about a certain book from some reliable person; whilst other titles were known to him only by quotation (§ 9). The list of JĀBIR's books (§ 12) he borrowed from two catalogues in which JĀBIR himself had enumerated his own writings. AN-NADĪM tells us that he saw some of the manuscripts which had once been in the possession of the monk STEPHANUS, an Alchemist of Mosul (§ 18). He also mentions an autograph of IBN WAḤSHĪYA and a manuscript written by a famous calligrapher (§ 15). Elsewhere (§ 19) we learn that the works of another Alchemist of his time, AS-SĀ'IH AL-'ALAWĪ, came from the province of Jibāl (the ancient Media). AN-NADĪM does not, however, confine his labour to the titles of books, but he gives also some information about the origin of Alchemy, on Hermes and the

Pyramids, a list of renowned Alchemists and also biographical data. With one of the Alchemists he was personally acquainted (§ 24). Once he gives the name of his informant (§ 10), but elsewhere he contents himself with some vague reference to 'a reliable person', 'some Alchemists', 'scholars and booksellers' (§ 10), etc. It is evident, however, that he drew the main bulk of his materials from written sources, though he very seldom mentions them (*e.g.*, in § 3). He quotes AR-RĀZĪ (§§ 1 and 10, end), and it was perhaps from the books (enumerated in § 14) of this staunch advocate of Alchemy that AN-NADĪM drew his general information on this subject.

3. AN-NADĪM's *Attitude towards Alchemy*.

AN-NADĪM had no high opinion of Alchemy, or of its adepts. In the opening as well as in the closing section, he is careful to dissociate himself from the Alchemists whose opinions on this subject he reproduces, and whenever he speaks of successful Alchemists, he never forgets to frame his remarks in terms which will leave the trustworthiness of Alchemy in the balance. Of a contemporary Alchemist who was credited with having been successful, he tells us that he never found him otherwise than in straitened circumstances, and dirty by reason of the chemical work he was in the habit of doing (§ 24). He also knows that Astrology and Alchemy were looked upon as unlawful by many Muslims, and though he himself, being a Shī'ite, is not narrow-minded, yet he takes care to guard himself in dealing with this subject by stating that only Allāh knows what this Art is about (§ 1, end).

4. *Language and Style of the FIHRIST*.

Although AN-NADĪM was a man of wide reading and distinct taste for literary achievement, yet the *Fihrist*, by the very nature of its rather technical contents, lies outside the domain of *belles-lettres*. AN-NADĪM's style, therefore, is plain and free from all rhetorical devices, so common in the rhymed prose of his more ambitious contemporaries. His language represents the colloquial of the educated classes of the capital. Occasionally his sentences are ungrammatical in sequence, and even contravene the rules of grammar.

5. *The Rôle of Alchemy in the Development of Islamic Thought*.

For an adequate understanding of the *Tenth Discourse*, and for the proper use of the materials gathered therein, it is necessary to grasp the important part which alchemy played in the development of science in the Islamic Middle Ages. It is not sufficient merely to be aware that the Goldmaker's Art was based on the belief that all metals were in the last resort the same, that gold was the purest of them, and that there existed an elixir by which base metals could be transformed into pure ones. This belief in the transmutability of metals was intimately connected with, and dependent upon, certain ideas which, in their turn, were the outcome of philosophical conceptions concerning the universe and

its nature. This philosophy ⁶—commonly known as Arabian philosophy, though, apart from the language in which it was written, there is little that is Arabic about it—was the heritage left by Oriental Hellenism to the world of Islam. It included many heterogeneous elements derived from the different schools of Greek thought, Platonic, Pythagorean, Aristotelian, etc., with a strong influx of Egyptian and Chaldean wisdom. Its backbone, however, was the Neo-Platonic Theory of Emanation. Starting from the premise that there can be no infinite chain of causes, this philosophy postulates the existence of God as the First Cause. He is the cause of the movement of the uppermost sphere. From Him emanate in uninterrupted chains the separate Intelligences, each of which is possessed of knowledge of its own essence and origin, and thereby becomes the cause of the subsequent Intelligence and of a corresponding sphere. In this way the Intelligences pervade the spheres of the fixed stars, of the zodiac, of the five planets, of the sun, and of the moon. From the Intelligence of the sphere of the moon, there emanates the active Intelligence which contains in it all forms of this sublunary world of generation and corruption. In the processes of emanation the planets play an important rôle as agents intermediary between the stars and the earth; for when a planet reaches its apogee, it receives the emanation of the stars, and whilst reaching its perigee, it transmits this emanation to the sublunary world. Moreover, each planet has its own spirituality (*pneuma*) which it hands down to the spheres that lie below. The human soul, too, is descended from the world of Intelligence. The nature of Man, therefore, possesses two opposite aspects; his soul, incarcerated in the body, is subject to the influence of the heavenly Spheres; but, if he develops his intelligence, he sets himself free and returns to his heavenly origin. Muslim philosophers differ considerably about the numbers and functions of the spheres and the Intelligences, about the nature of human reason, and about many other particulars of this cosmological scheme. But it seems that to all of those—Muslim or otherwise—who in the days of Mediævalism devoted their energies to scientific studies, the universe appeared as an immense cave roofed by the celestial world; to them this sublunary world, with its bewildering perplexity of minerals, plants, and animals, was ruled by the passions and desires of the Soul, whilst beyond the sphere of the moon begins the realm of the pure passionless, unchanging, and eternal Intelligence. By this Intelligence, man is able to understand how under the influence of the stars (which, of course, could be interpreted in very different ways) the four elements and the souls are continually being combined and again dissolved. In this analysis of the natural processes which are going on in the world of sensation, they were greatly helped by the notion of *virtutes* or specific properties (*ḵhawāṣṣ*). Starting from the observation that a drug is characterized by its specific action, a poison by its virus, etc., they formed the idea that everything existent must needs have a *specific property* by which it is unmistakably distinguished from all other things. This could be so, either

⁶ See, e.g., A. Guillaume in *The Legacy of Islam*, Oxford, 1931, 239 *seqq.*

permanently or temporarily; always, or on certain conditions, *e.g.*, by a certain colour, smell, sound, shape; but the differentiation was also by a certain number, a name, etc. They went even farther and concluded that a knowledge of the *virtutes* and *pneumata* would enable them to combine these commonly separated and scattered powers and direct them towards the ends desired by the individual philosopher. It is for this reason that many mediæval scholars considered that Astrology, Alchemy, and Magic were sciences, and believed in the efficacy of horoscopes, amulets, talismans, charms, etc.

The conception, that man, by his intellectual faculties, should be able not only to understand the universe, but also, by utilizing the laws of nature, to predict the future and even try to shape its course, was totally alien to the conceptions of MUḤAMMAD and his early followers. For MUḤAMMAD, reason was no judge of revelation. So great was his conviction of Allāh's omnipotence that he could not conceive any limitation of divine power. Hence the early Muslims thought it absurd to imagine that human reason should be able to fathom Allāh's will, and to suppose that Allāh should limit his own power by self-imposed rules of conduct, by the laws of nature, or by any other rational principle. It was only after the Muslims had come into contact with the ancient civilisations of the Near East that the dispute about predestination and free will again brought the problem of reason to the fore. The Mu'tazilites, who held the view that Allāh could not do as he pleased, but, as a moral being, was bound by his own morality, taught not only the principle of divine righteousness, but the notion that reason was the touchstone of religious truth. The adoption of Greek philosophy and other 'ancient sciences' was largely their doing. In interpreting the physical world, they adopted the atomism of Demokritos, which they tried to reconcile with the monotheism of Islam. They believed in causality, as the foundation-stone of all rational science; and this belief carried them further and further away from the original doctrines of Islam. They were compelled to deny the pre-existence of the Qur'ān; they rejected large parts of the oral Traditions, and, last but not least, they showed themselves extremely fanatical whenever they were in power. This led to their overthrow by their orthodox opponents, who rejected rationalism and philosophy. It is true that about A.D. 900 the orthodox theologians felt the need to bring about some sort of reconciliation between their faith and current philosophy, but they were content to adopt the formalism of logic, and neither the predominance of reason over tradition nor the law of causality was recognized.

Mu'tazilism, however, was not altogether stamped out; but, naturally, from the middle of the ninth century, its adherents remained in active opposition to the tenets of orthodox Islam. This opposition was predominantly Shī'ite, for nearly everybody who was hostile to the secular power, *i.e.*, the Abbāsids, belonged in one way or another to the party (*shī'a*) of 'ALĪ, MUḤAMMAD'S son-in-law, and claimed that one of 'ALĪ'S descendants should become leader (*Imām*) of the Muslim community. The nett result was that not only Mu'tazilite

doctrines, but also Greek philosophy and the other 'ancient sciences' were recognized and studied by the Shī'ites and, especially, by their radical wing among the so-called extremists. The legacy of Greek philosophy and learning which the Muslims had taken over from their Syrian, Egyptian, Harranian and Persian predecessors, was soon blended with ultra-Shī'ite theories about the Imām, or politico-religious leader, whose appearance was eagerly expected in these circles. The so-called *Corpus Jabirianum* in its present form shows such a combination of Alchemical and Medical teachings with Shī'ite tenets. An even better example is offered by the 'Brethren of Purity' at Basra, a secret society that flourished about the middle of the tenth century. Their *Treatises* form a veritable encyclopædia of knowledge, extending to every branch of philosophy, natural science and politico-religious theory. Here we find the mathematical sciences of the *Quadrivium*, the logical science of Aristotle's *Organon*, psychology, the knowledge of the three kingdoms of nature, and, finally, the theory of a philosophical religion which was to be brought about by the Brethren of Purity. Here again we find the belief that the philosopher is able to foresee the future and to shape the course of events. Here again it is held that prophecies, *omina*, dreams, inspirations, do not belong to the sphere of occultism but can be fathomed by human reason. Horoscopes, magic squares, amulets, talismans, etc. are, therefore, recognized by the Brethren of Purity as efficacious tools of the philosopher's endeavours to be applied on strictly scientific lines. It was this practical side of their activities which made them suspect to the secular power, and compelled them to live in hiding. Their treatises were surreptitiously circulated among their followers, without stating their authors' names. It seems that IBN AN-NADĪM was unaware of their existence, for he does not mention them in his *Fihrist*. There were, however, other Alchemists as well, who refrained from wild theories and devoted their energies to a more sober solution of scientific problems. The studies of H. E. Stapleton, Azo, and Ḥusain on 'Chemistry in 'Irāq and Persia in the Tenth Century, A.D.'⁷ have shown that in this respect AR-RĀZĪ occupies an important place by adhering 'to nothing that could not be proved, by experiment and test, to be actual fact'. Strange as the Alchemical theories current in the tenth century A.D. may seem to the modern scientist, yet we can safely say that the Arabian Alchemists too were stumbling forward on their path with their eyes fixed on the stars.

TRANSLATION.

[On the manuscripts K, L, and S, see the Preface (p. 82). Flügel's edition is referred to by page and line. The *apparatus criticus*, given in the footnotes, contains only the more important variants. The Arabic numbers refer to the Commentary which follows at the end (p. 110). Words in brackets are added by the translator.]

⁷ *Memoirs of the Asiatic Society of Bengal*, 1927, viii, 317-418.

In the name of Allāh, the Beneficent, the Merciful !

The Tenth Discourse of the Book of the Catalogue (*al-Fihrist*), containing the account of the Alchemists and Seekers after the Philosophers' Stone amongst Philosophers both ancient and modern, and the Names of their Books.

§ 1. Introduction.

Says MUḤAMMAD IBN ISHĀQ AN-NADĪM, known as IBN ABĪ YA'QŪB AL-WARRĀQ : The adepts of the Art of Alchemy, which is the art of making gold and silver without (recourse to) mining, assert that the science of the Art was first discussed by Hermes ¹, the Sage, the Babylonian, who, on the occasion of the dispersion of mankind from Babel, went to Egypt and became King of Egypt. (They assert) also that he was a Sage, a Philosopher, and successful in the Art, regarding which he wrote a number of books ; that he speculated on the Specific Properties (*Khawāṣṣ*) and the *Pneumata* (*rūḥānīyāt*) of things ² ; that he was successful in his research and speculation on the science of the Alchemical Art and understood the making of Talismans ; and that he wrote many books on this subject. It is said, however, that this (*i.e.*, the making of Talismans) had been already done thousands of years before Hermes, according to the doctrine of those who believe in the eternity of the world (*aṣḥāb al-qidam*) ³.

MUḤAMMAD IBN ABĪ BAKR AR-RĀZĪ, *i.e.*, ZAKARĪYĀ' ⁴, asserts that no one ^a can succeed in the science of Philosophy, nor can a scholar be called a philosopher, unless he (first) succeeds in the science of the Alchemical Art, so that he becomes by this independent of everybody, whilst everybody else stands in need of him by reason of his knowledge and resources.

Another group of Alchemists say that this (science) was revealed by Allāh—May His name be exalted !—to some adepts of this Art ; whilst others say that it was revealed to Moses, the son of (352) Amram, and to his brother Aaron—Peace be upon them !—and that it was Korah ⁵ who, on their behalf, took charge of it. When he had gathered much gold and silver, he started hoarding treasures ; but as soon as Allāh saw him insolent, haughty and oppressive because of his wealth, He snatched him away on the strength of the prayer of Moses against him ^b.

In another passage of his book ⁶, AR-RĀZĪ asserts that many philosophers, Pythagoras, Demokritos, Plato, Aristotle, and, finally, Galen practised the Art.

Says MUḤAMMAD IBN ISHĀQ : Both these groups (*i.e.*, the ancient and modern Alchemists) possess books and sciences on the Art. But this is a thing which Allāh alone knows. We, in mentioning them, are free from blame and slander ⁷.

^a p. 351, 25 : add with K *li-aḥādīn* after *yaṣīḥḥa*.

^b p. 352, 3 : omit with S the last word (*as-salām*).

§ 2. Account of HERMES the Babylonian ⁸.

Opinions differ about him ; for some say that he was one of the Seven Guardians who were ordained to guard the Seven Houses (of the planets), and that the house of Mercury ('*Uṭārid*') was assigned to him, and that he was called by its name ; for, in the Chaldean language, '*Uṭārid*' means Hermes. Others, however, say that, for certain reasons, he migrated to Egypt and became its ruler. He had some children—amongst them ṬĀṬ, ṢĀ, ASHMUN, ATRĪB and QIFT ⁹ ; and he was the Sage of his time. When he died, he was buried in the building in the city of Old Cairo (*Miṣr*) which is known as Abū Hirmis ; whilst the common folk know it as *Al-Haramain* ('the Two Pyramids') ¹⁰, for one of them is his tomb, and the other one that of his wife, or, according to others, that of his son who succeeded him after his death.

§ 3. A Narrative concerning the Two Pyramids,—and Allāh knows best (what they are !) ¹¹.

Once I came across a book, attributed to a member of the Thawāba-family ¹², that contained part of the history of the world and its wonders, and dealt amongst other topics with buildings, kingdoms, and (all) sorts of nations. In it he (the author) said : I was told by AḤMAD IBN MUḤAMMAD AL-ASHMŪNĪ that a certain governor of Egypt wanted to know what was on the top of one of the pyramids. This he desired and tried to discover by all means. Finally a man from India came to him, and, playing on his covetousness, he promised him a large gift ^c if he would ascend to its top. He (the narrator) says : Nothing but giddiness ^d and fright at looking ahead, when climbing up and down, make a man unable to ascend (the pyramid).

He says : This building has a base measuring 480 by 480 Hāshimite ¹³ cubits ; then the structure tapers off ; so that when you reach its top, the measurement of the platform is 40 by 40 cubits. This is in accordance with (the rules of) geometry. Now, as for that man who ascended (the pyramid), he said, after coming down, that he had seen the top and that it had space for 20 Bactrian camels to lie down.

He says : There was in the middle of this platform a fine cupola, and in the midst of it something like a tomb. At the head of this tomb stood two stone slabs of perfect workmanship and beauty ^e, and rich in colours. On each of them was a statue of stone, one representing the figure of a man and the other that of a woman ; they had their faces turned to one another. The man held

^c p. 352, 19 : read with Fleischer *bi-raghḡbatin* instead of *bi-raghbatin* of K, S, and Flügel.

^d p. 352, 20 : read with K and S *al-murār* instead of *al-madār*.

^e p. 352, 25 : read with al-Maqrizi, p. 14, 15, Graefe, *wa l-ḡusn* instead of *fī l-ḡusn* of K, S, and Flügel.

a tablet with an inscription on it in his hand, whilst in the hand of the woman was a mirror and a golden instrument like a chisel. Between the slabs there was a stone-vessel covered with a golden lid. He says: I tried to remove it, and eventually I succeeded in doing so; and I saw in it something like pitch that had become dry, but without its smell. He says: I put my hand into it, and there was in it a golden casket; I opened its lid, there was fresh blood in it, which coagulated as soon as it met the air as blood usually does, and which had already dried up when I was ready to descend. He says: On the tomb there were stone covers which I repeatedly tried to remove, until at last I managed to lift one of them. There was a man lying on the back of his head, well preserved, but absolutely dried up (mummified); the shape of his body was clearly recognizable (353), and his hair still visible, and at his side a woman of the same appearance. He says: And this platform had a cavity about the height of a man, and, round about, something like semi-oval^f recesses with stone vaults on which there were figures partly lying, partly standing, and pictures as well as utensils^g of unknown shape. But Allāh knows best (if this be true).

In ¹⁴ Egypt there are buildings called *Barābī* ¹⁵ (Temples), built of huge stones, that surpass all measures. Such a temple consists of apartments of various shape in which there are places for grinding^h, pulverizing, dissolving coagulating and distilling, which shows that the temple was erected for (carrying out) the Alchemical Art. In these buildings there are paintings, and inscriptions of unknown purport in the Chaldean and Egyptianⁱ languages. There were also found subterranean treasure-houses, wherein these sciences were written on parchment treated with lime^k, on (papyrus made of) bast from the white poplar (*tūz*) such as are used by the bowmakers ¹⁶, on plates of gold and copper, and on stone.

Hermes composed books ¹⁷ on the stars, on Magic (*nīranjāt*) and on the *Pneumata* (*rūhānīyāt*).

^f p. 253, 2: instead of *al-mismār dhāt* S has *an-nīmakhādajāt*, whilst K has *an-nīmakhārājāt*, in both cases without any dots or vowel-signs. The correct spelling is, as pointed out by Ritter, *an-nīmkhāyājāt*, plural of the Persian *nīmkhāya*, lit. 'half-egg', which means *gunbadh*, 'cupola, dome' (see Vullers, *Lexicon Persico-Latinum*, ii, 1393 b).

^g p. 353, 2: read with K, L, S *al-āla* instead of *al-āliha*, 'gods'.

^h p. 353, 4: read with Plessner *li ṭ-ṭaḥn* instead of *li ṣ-ṣaḥn* of K, S, and Flügel.

ⁱ p. 353, 5: K has *wa n-Nabaṭīya*, 'and Nabatean', instead of *wa l-qibṭīya* of S and Flügel. 'Nabatean' here means the language of the ancient Pagans of Egypt.

^k p. 353, 6: read with Nöldeke, *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 1904, lviii, 496, footnote, *al-fulḥān al-munawwar* instead of Flügel's *al-fuljān al-mutawwaz*; L and S have *al-fulḥān*, K has *al-mutawwaz*, S leaves the word without dots. *fulḥān* is a loan-word from Syriac *puḥḥānā*, 'parchment', and is explained by an-Nadīm in another passage, p. 21, 12, Flügel, by "hides of wild asses" (*juḥūd al-ḥamīr al-waḥshīya*); *al-munawwar* is derived from *nūra*, 'lime'.

§ 4. The Books of Hermes on the Art ¹⁸.

1. *The Book of Hermes to his Son on the Art.*
2. *The Book of Flowing Gold.*
3. *The Book to Ṭāṭ on the Art.*
4. *The Book on the Making of the Bunch of Grapes (al-'unqūd).*
5. *The Book of Secrets.*
6. *The Book al-Hādītūs ^l.*
7. *The Book al-Malātīs.*
8. *The Book al-Iṣṭamākhīs ^m.*
9. *The Book al-Iṣṭamātīs ⁿ.*
10. *The Book of Armenios, the pupil of Hermes.*
11. *The Book of Asklepiades (?) ^o, the pupil of Hermes, dealing with the opinion of Hermes.*
12. *The Book of 'Αρχαϊκή ^p.*
13. *The Book of Damānūs ^a to Hermes.*

§ 5. OSTANES.

One of the philosophers and adepts of the Art, who became famous by it and composed books on it, is OSTANES ¹⁹, the Roman (*ar-Rūmī*) of Alexandria. According to what he mentions in one of his treatises, he wrote 1000 books and treatises, each of which has a name of its own. The books of these men are written in an allegorical and symbolic language ²⁰. By him is the following book :

Conversation of Ostanes with Tauhīr(?) ^r, King of India.

§ 6. ZOSIMOS (*RĪSAMŪS*) ²².

Another of them is ZOSIMOS (*Rīsamūs*), he follows the course of Ostanes ²². He composed a book which he called '*The Keys on the Art*' comprising a number of books; and he composed Treatises, in the following order: *First*, *Second*, etc. (*treatise*), which are known as '*The Seventy Treatises*' ²³.

p. 353, 11 : *al-Hārītūs*, S : *al-Hādītūs*, K.

^m p. 353, 12 : *al-Iṣṭamākhās*, S : *al-Ismākhās*, K, both without dots or vowel-signs.

ⁿ p. 353, 12 : read with Plessner *al-Iṣṭamātīs* instead of *as-Salmātīs*, S ; *as-Salmāṭas*, K.

^o p. 353, 12 : read, instead of Flügel's *Nīlādas* (in S without dots, in K *Salādaṣ*), perhaps *Asqalībiyādas*.

^p p. 353, 13 ; read *al-arkhīqī* instead of *al-adkhīqī* of K, S, and Flügel.

^q As this name is written in K and S without dots, it could be also read *Damābūs*, *Damāthūs*, *Damāyūs*.

^r The name of this Indian, as given in K, consists of the letters *M w h y n*, where *y* may be replaced by either *b*, *t*, *th*, or *n*. In S, the first letter is *y* (or *b*, *t*, *th*, *n*), and the last letter *r* (or eventually *z*).

§ 7. The Names of the Philosophers who have discussed the Art ²⁴.

- | | |
|---|--|
| 1. HERMES ²⁵ . | 28. MARIANOS ^f . |
| 2. AGATHODAIMON (<i>AGHĀDHĪMŪN</i>). 29. <i>SAFANDAS</i> ^g . | |
| 3. <i>ANṬŪS</i> ^s . | 30. <i>MAHRĀRĪS</i> ^h . |
| 4. APOLLONIOS (<i>BALĪNŪS</i>) ⁱ . | 31. <i>FARNĀFĀNAS</i> ⁱ . |
| 5. PLATO (<i>AFLĀṬŪN</i>). | 32. <i>MAṢṬIYŪS</i> ^k . |
| 6. ZOSIMOS (<i>RĪSAMŪS</i>). | 33. <i>KĀHIN ARṬĀ</i> . |
| 7. <i>AṢṬŪS</i> . | 34. <i>ARAS AL-QASS</i> . |
| 8. DEMOKRITOS (<i>DĪMAQRĀṬ</i>). | 35. <i>KHĀLID IBN YAZĪD</i> . |
| 9. OSTANES ^u . | 36. STEPHANOS (<i>ISṬIFAN</i>). |
| 10. HERAKLEIOS (<i>HIRAQL</i>). | 37. <i>ḤARBĪ</i> ^l . |
| 11. THEODOROS (<i>TADRŪS</i>) ^v . | 38. <i>JĀBIR IBN ḤAYYĀN</i> . |
| 12. MARY (<i>MĀRIYA</i>). | 39. <i>YAḤYĀ IBN KHĀLID</i> |
| 13. <i>RASĀWARAS</i> ^w . | <i>IBN BARMĀK</i> . |
| 14. <i>AFRĀGHSARĪS</i> ^x . | 40. <i>KHĀṬĪF AL-HUDHALĪ</i> ^m . |
| 15. STEPHANOS (<i>ISTIFĀNAS</i>) ^y . | 41. <i>AL-QARĪḤĪ</i> ^m . |
| 16. ALEXANDROS (<i>ISKANDARŪS</i>). | 42. <i>DHU N-NŪN AL-MIṢRĪ</i> ^m . |
| 17. CHYMES (<i>KĪMĀS</i>). | 43. <i>SĀLIM IBN FARRŪKH</i> ⁿ . |
| 18. <i>JĀMĀSP</i> ^z . | 44. <i>ABŪ 'ISĀ AL-A'WAR</i> . |
| 19. ZOROASTER ^a . | 45. <i>AL-ḤASAN IBN QUDĀMA</i> . |
| 20. ARCHELAOS (<i>ARKHĀLĀ'ŪS</i>) ^b . | 46. <i>ABŪ QIRĀN</i> . |
| 21. <i>MARQŪNAS</i> . | 47. <i>AL-BŪNĪ</i> ^o . |
| 22. <i>SINAQḤĀ</i> . | 48. <i>SAJJĀDA</i> ^p . |
| 23. CHYMES (<i>SHĪMĀS</i>). | 49. <i>AR-RĀZĪ</i> . |
| 24. ZOSIMOS (<i>ZŪSAM</i>) ^c . | 50. <i>AS-SĀ'IḤ AL-'ALAWĪ</i> . |
| 25. <i>FŪRŪS</i> . | 51. <i>IBN WAḤSHĪYA</i> . |
| 26. PYTHAGORAS (<i>BĪTHAGHŪRAS</i>) ^d . | 52. <i>AL-'AZĀQIRĪ</i> . |
| 27. <i>DĪLĀ'ŪS</i> ^e . | |

^s *Aṣṭūs*, K, without dots.

^t p. 353, 23 : read with Plessner *Balīnūs* instead of *Malīnūs* of K, S, and Flügel.

^u *Iṣṭāmas*, K.

^v p. 353, 24 : read with Plessner *Tadrūs* instead of *Būrūs* of S and K (both without dots) and of Flügel.

^w *Dasāwaras* : *Rasāwaras*, S : *Rasāwas*, K, both without vowel-signs.

^x *Afrāghīnarīs*, K, without dots.

^y *Iṣṭifānas*, S : *Iṣṭānas*, i.e., Ostanes, K.

^z p. 353, 25 : K has erroneously *Hamāmanāi*.

^a S has *Zarāštūs* (without dots) instead of Flügel's *Darāštūs*, whilst K has *Riyāštūs* (without dots).

^b K has erroneously *Aukhālā'ūsh*.

^c *Dūsam*, K, without vowel-signs.

^d Written in K and S without dots.

^e p. 353, 26 : *Dīlā'ūs*, K : *Wīlā'ūs*, S.

^f *Maryānas*, S : *Mawyānas*, K, both without dots.

^g *Safandas*, S : *Safandaras*, K, both without dots.

They are those who are renowned for the preparation of 'the Head' and the Perfect Elixir. These are followed by those who also aimed (354) at the same end, but fell short (of it) owing to their lack of capacity, and only achieved the external operations ^{25a}. They are many: and we shall mention some of them at their (proper) place, if Allāh,—May He be exalted!—willeth ²⁶.

§ 8. KHĀLID IBN YAZĪD IBN MU'ĀWIYA IBN ABĪ SUFYĀN,
a Muslim (and) modern (Alchemist) ²⁷.

Says MUḤAMMAD IBN ISḤĀQ: It was KHĀLID IBN YAZĪD IBN MU'ĀWIYA who busied himself in bringing to light the writings of the ancients on the Art ²⁸. He was an orator and poet, eloquent, accomplished ^a and a man of judgment. He was the first (Muslim) for whom medical, astronomical, and chemical writings were translated (into Arabic). He was generous. It is said that (when) the remark was made to him: 'You have wasted ^r the best part of your labour in search of the Art', KHĀLID replied: 'I only did so to enrich my friends. I tried for the Caliphate, but I failed. I have not found any compensation for it, save in reaching the highest degree of this Art, so that nobody who knows me, or whom I know, may be compelled to stand at the gate of a ruler in want (as a petitioner), or in fear (seeking protection)'. And it is said—but Allāh knows best (what is the truth)—that he was successful in the Art. He wrote on this a number of treatises and books, and composed many poems on this subject ²⁹; of which I have seen about 500 folios. I have also seen the following of his books:

1. *The Book of Amulets* (al-ḥirazāt ^s) ³⁰.
2. *The Great Book of the Scroll* (as-ṣaḥīfa).
3. *The Small Book of the Scroll*.
4. *The Book of the Testament to his son on the Art*.

§ 9. Names of Books composed by the Sages, which either we have seen ourselves, or which a reliable witness informed us he had seen, or which the learned of the Art have cited in their writings ³¹.

^h *Mahrārīs*, K: *Mahdārīs*, S, both without dots.

ⁱ *Farnāfānas*, S: *Farqāfānas*, K, both without dots.

^k In K and S without dots.

^l p. 353, 27: instead of *Harbī*, K has erroneously *Harī*.

^m p. 353, 28: The names of these three alchemists are missing in K. Flügel's *Khāṭif al-Hindī al-Ifranji* combines two different persons; S has *al-Hudhalī*; the next name, Flügel's *al-Ifranji*, 'the Frank', which is written in S without any dots, I have emended in accordance with § 12, no. 95 (p. 356, 17).

ⁿ In S without dots, in K with *jīm* (*Furūj*).

p. 353, 29: in S without dots.

^p *Sajjāda*, K: *Sahāwa*, S, both without vowel-signs.

^q p. 354, 5: read with S *jāmi'an* instead of *ḥāziman*, 'resolute'; K has *ḥāmiyan*, without dots.

^r p. 354, 6: read with S *aḍa'ta* instead of *fa'alta* of K and Flügel.

^s p. 354, 11: *al-ḥarārāt* is a conjecture of Flügel; S has *al-ḥirazāt*, K *al-hūrat*, both without dots.

1. *The Book of DIOSKUROΣ^t on the Art.*
2. *The Book of MARY the Egyptian (Māriya al-Qibṭiyya) with the Sages, when they repaired to her.*
3. *The Book of ALEXANDROS on the (Philosophers') Stone.*
4. *The Book of the Red Sulphur (al-kibrīt al-aḥmar).*
5. *The book of DIOSKUROΣ^u when Synesios^v questioned him on the Problems.*
6. *The Book of STEPHANOS.*
7. *The Book of the Heavenly QRATES^w.*
8. *The Book of the Suns (?)^x.*
9. *The Great Book of MARY.*
10. *The Book of BUṬŪR^y IBN NŪḤ.*
11. *The Book of the Anecdotes (nawādir) of the Philosophers, concerning the Art.*
12. *The Book of EUGENIOS^z.*
13. *The Book of THAMŪD^a.*
14. *The Book of Queen KLEOPATRA.*
15. *The Book of MĀGHAS^b.*
16. *The Book of PYTHAGORAS^c.*
17. *The Book of BILQĪS, Queen of Egypt, which begins with 'When I ascended the mountain'.*
18. *The Book of the Elements (al-anāṣir). By ZOSIMOS (Rīmas).*
19. *The Book of SERGIOS of Rās'ain to QUWAIṚĪ, Bishop of Edessa.*
20. *The Book of SAQIYĀS^d on his wisdom^e (?) to King HADRIAN^f.*
21. *The Greater Book of ARAS.*
22. *The Smaller Book of ARAS.*
23. *The Book of ANDARMĀ^g.*

^t p. 354, 13 : *Dīsqurus* ; K has *Dīsīqūrīdas*, S *Dīsqūsāl*, both without dots.

^u p. 354, 15 : *Dīsqurus* ; K and S have *Dīsqursāl*.

^v p. 354, 15 : *Badsīyūs*, Flügel and also K and S, both without dots ; read *Sinasīyūs*.

^w p. 354, 16 : *Qarātīs* in K and S, both without dots (hence Flügel's *Farānīs*), seems a mistake for *Qarātīs*, as already pointed out by Steinschneider, *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 1904, I, 363.

^x p. 354, 16 : instead of *as-sumūs* (Flügel), K and S read *ash-shumūs*.

^y In K and S without dots.

^z p. 354, 17 : *Auḡiyānas* has in S no dots, whilst in K this title is missing.

^a In K and S without dots. Plessner suggests *Nimrud*, 'Nimrod'.

^b p. 354, 18 : *Māghas*, K : *Mā'ash*, S.

^c *Sagras*, Flügel : *Sa'ras*, S : *Sa'ūs*, K.

^d p. 354, 20 : *Sagnās*, Flügel, in K and S left without dots, except the *g*, which is marked in S.

^e *ḥikmatihī*, Flügel : *ḥilmatihī*, S : *ḥamalahihī*, K, both without dots.

^f *Adriyānūs* is written in K and S without dots ; but the *r* looks in both MSS. rather like a final *b*.

^g In K and S without dots.

24. The Book of BĪGHĪ to MARĪNĀ ^h.
25. The Book of THEODOROS ⁱ the Sage.
26. The Book of the CHRISTIAN (an-Naṣrānī) in which he says 'Wisdom is wisdom according to its name'.
27. The Book of the Lord of the Niche (ṣāḥib al-mihrāb).
28. The Book of . . . ^k from Ephesus to Nisāfaras ^l.
29. The Book of the Seven Wise Brothers on the Art.
30. The Book of DEMOKRITOS.
31. The Book of ZOSIMOS to all the scholars on the Art.
32. The book of GERMANOS ^m, the Metropolitan (maṭrān) of Rome (Rūmiya), on the Art.
33. The Book of SERGIOS, the Monk, on the Art.
34. The Book of MĀGHAS, the Sage, on the Art.
35. The Epistle of PELAGIOS ⁿ on the Art.
36. Th Book of THEOPHILOS on the Art ^o.
37. The First Book of the Two Words.
38. The Second Book of the Two Words.
39. The Epistle of the Indians ^p to ALEXANDROS.
40. The Book of PETRONIUS (?) ^q.
41. The Book of QABĀN ^r.
42. The Greater Book of HERAKLEIOS in 14 books.
43. The Book of ASFĪDAS (or SAFĪDAS) ^s which deals with dreams, concerning the Art.
44. The Book of SERGIOS on the Art.
45. The Book of JĀMĀSP on the Art.

§ 10. The Life of JĀBIR IBN ḤAYYĀN AŞ-ŞŪFĪ
and the titles of his works ³².

He is ABŪ 'ABDALLĀH JĀBIR IBN ḤAYYĀN B. 'ABDALLĀH AL-KŪFĪ, known as AŞ-ŞŪFĪ. People differ about (355) him, for the Shī'ites say that he is one of their great men and one of the 'Gates' ³³, and they assert that he was

^h p. 354, 21 : instead of *Maribā*, read with S *Marinā* ; K has *Madīnā*, without dots.

ⁱ p. 354, 21 : instead of *Nādaras*, read *Thādurus* ; K and S have no dots.

^k p. 354, 22 : S has *Andaryā niyā* in two words, without dots, whilst K has *Anūrinā*, without dots.

^l In K and S without dots.

^m p. 354, 25 : *Karmānūs* has in K and S no dots.

ⁿ K and S have *Balākhīs* ; read *Balājīs*.

^o This title is missing in K.

^p p. 354, 26 : instead of *hibat*, S has *hiba ilā* (without dots), whilst K has *Hind ilā*. *Hind* being an Arabic female name, I read *al-Hind*, 'The Indians'.

^q p. 354, 27 : *Batrānūs* has in K and S no dots.

^r p. 354, 27 : *Qabān*, in K and S without dots.

^s p. 354, 27 : *Sagrās*, in K and S without dots.

the companion of JA'FAR AṢ-ṢĀDIQ—Peace be upon him![†]—, and that he was a Kufan. Some philosophers, however, maintain that he was one of themselves, and that he composed books on logic and philosophy, whereas the seekers after the Philosopher's Stone assert, that the leading position (in this Art) in his days was held by him, but that he lived in concealment. They maintain that he kept roaming about the countries without settling in a place because he feared the government would attempt his life³⁴. It is also said, however, that he belonged to the circle of the Barmacides³⁵, was devoted to them and showed respect (especially) to JA'FAR B. YAḤYĀ; for those who maintain this, say that he means, by 'his master JA'FAR', this very Barmacide, whilst the Shī'ites assert that he means by this (phrase) JA'FAR AṢ-ṢĀDIQ—Peace be upon him![†] A reliable man who practised the Art told me that he (the narrator) used to live in the street of the Syrian Gate, in a lane known as 'Gold Lane'. Now this man told me that JĀBIR for the most part lived at Kufa and, owing to the city's good air, prepared there the elixir. When, at Kufa, the cellar was discovered in which a golden mortar weighing 200 *riṭl*³⁶ was found, the place—said this man—where they had found it (the mortar) was the actual house of JĀBIR B. ḤAYYĀN, but they found nothing else in the cellar except the mortar and a place for carrying out (the processes of) Solution and Fixation. This happened in the days of 'IZZ AD-DAULA IBN MU'IZZ AD-DAULA (r. 356/967–367/977). The Chamberlain ABŪ SABUKTAGĪN told me that he himself went to receive this (treasure).

Many scholars and elders of the Booksellers' Corporation say that this man, I mean JĀBIR, did not exist at all, whilst some of them say that, if he really did exist, he composed nothing but the *Book of Mercy* (*Kitāb ar-Raḥma*)³⁷, and that those books (supposed to have been composed by him) were written by other people and then ascribed to him. But I say that for an eminent man to sit down, and weary himself out with the composition of a book comprising 2000 folios, fatiguing his talents and thoughts in composing it and (tiring) his hand and body in writing it down, and then to assign it to another person, either real or imaginary—this, I say, is a kind of foolishness. Such a thing no one would endure; nor would anyone who has busied himself with science even for a moment embark on it; for what kind of profit would there be in it and what sort of advantage? (No,) the man (JĀBIR) really existed: his circumstances are too clear and well known and his writings too important and numerous (for his authorship of them to be doubted).

This man has written books on the tenets (*madhāhib*) of the Shī'ites, which I shall mention in their (proper) place³⁸, and books on various topics of the sciences which I have already mentioned in their (respective) place in this book³⁹.

[†] K and S have here, according to the custom of the Shī'ites, the formula 'Peace be upon him!', whilst Flügel's 'May Allāh be pleased with him!', p. 355, 1, is due to a Sunni copyist who considered this formula only applicable to Prophets (see Goldziher, *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 1904, 1, 121 seq.).

It has been said that he hailed from K orasan ⁴⁰. AR-RĀZĪ in his own books on the Art introduced him as follows : ' Saith our Master, ABŪ MŪSĀ JĀBIR IBN ḤAYYĀN '.

§ 11. The names of his Pupils ⁴².

1. AL-KHIRAQĪ, after whom the Khiraqī Street in Medina is named.
2. IBN 'IYĀD AL-MIṢRĪ.
3. AL-IKHMĪMĪ.

§ 12. The names of his Books on the Art ⁴³.

A big catalogue by him exists, which comprises everything he has written on Alchemy and the other subjects, and there exists also a small catalogue by him, which comprises only what he has written on the Art ; and we shall mention a number of his books which either we have seen, or which reliable people have seen and mentioned to us.

1. *The First Book of the Element of the Foundation* (uṣṭuquṣṣ al-ass), for the Barmacides.
2. *The Second Book of the Element of the Foundation, for the same.*
3. *The Book of Perfection* (al-kamāl), and this is the third (book addressed) to the same.
4. *The Great Book of the One* (al-wāḥid).
5. *The Small Book of the One.*
6. *The Book of the Pillar* (ar-rukṇ).
7. *The Book of Explanation* (al-bayān).
8. *The Book of Arrangement* (at-tartīb).
9. *The Book of Light* (an-nūr).
10. *The Book of the Red Tincture* (aṣ-ṣibgh al-aḥmar).
11. *The Great Book of Ferments* (al-khamā'ir).
12. *The Small Book of Ferments.*
13. *The Book of Processes based on Reasoning* (at-tadābir ar-ra'yīya).
14. *The Book known as ' The Third '.*
15. *The Book of the Spirit* (ar-rūḥ).
16. *The Book of Mercy* (az-zi'bak).
17. *The Book of the Interior Amalgams* (al-malāghim al-jauwānīya).
18. *The Book of the Exterior Amalgams* (al-malāghim al-barrānīya).
19. *The Great Book of the Amalekites.*
20. *The Small Book (356) of the Amalekites.*
21. *The Book of the Raging Sea* (al-baḥr az-zākhir).
22. *The Book of the Eggs* (al-baid).
23. *The Book of the Blood* (ad-dam).
24. *The Book of Hair* (ash-sha'r).
25. *The Book of Plants* (an-nabāt).
26. *The Book of Completion* (al-istifā').

27. *The Book of Well-Guarded Wisdom* (al-ḥikma al-maṣūna).
28. *The Book of Division into Chapters* (at-tabwīb).
29. *The Book of Salts* (al-amlāḥ).
30. *The Book of Stones* (al-aḥjār).
31. *The Book of the Chameleon* (abī qalamūn).
32. *The Book of Construction of the Circle* (at-tadwīr).
33. *The Book of the Splendid* (al-bāhir).
34. *The Book of Repetition* (at-takrīr).
35. *The Book of the Hidden Pearl* (ad-durra al-maknūna).
36. *The Book of Gradual Progress* (at-tadarruj) ^u.
37. *The Book of the Pure* (al-khāliṣ).
38. *The Book of the Encompassing* (al-ḥāwī).
39. *The Book of the Moon*.
40. *The Book of the Sun*.
41. *The Book of Combination* (at-tarkīb).
42. *The Book of Understanding* (al-fiqh).
43. *The Book of the Element* (al-uṣṭuquṣṣ).
44. *The Book of Animals* (al-ḥayawān).
45. *The Book of Urine* (al-baul).
46. *The Book of Processes, II*.
47. *The Book of Secrets* (al-asrār).
48. *The Book of Hiding Mines or Minerals* (kitmān al-ma'ādin) ^v.
49. *The Book of Quality* (al-kaifiya).
50. *The Book of the Sky* (as-samā'), i-vii.
51. *The Book of the Earth* (al-arḍ), i-vii.
52. *The Book of Extracts* (al-mujarradāt).
53. *The Book of Eggs, II*.
54. *The Book of Animals, II*.
55. *The Book of Salts, II*.
56. *The Book of Plants, II* ^w.
57. *The Book of Stones, II*.
58. *The Book of the Perfect* (al-kāmil).
59. *The Book of Praise* (al-madh) ^x.
60. *The Book of Remainers (or Surpluses) of the Ferments* (faḍalāt al-khamā'ir) ^y.

^u p. 356, 4: *al-budūḥ*, Flügel and S: *at-tadarruj*, K.

^v p. 356, 6: *Kitmān al-ma'ādin* is emended by Flügel to *Kīmān al-ma'ādin*. K and S have no dots.

^w p. 356, 9: instead of *al-bāb*, Flügel, S, and (without dots) K read, according to no. 25, *an-nabāt*.

^x p. 356, 10: Flügel's *aṭ-ṭarḥ* (Projection) was in correction of *aṭ-rah*, K, which in its turn may have been a misreading for *al-madh*, S,

^y *al-ḥamā'ir*, S: *al-ḥamā'is*, K.

61. *The Book of the Element* (al-‘unṣur).
62. *The Book of Combination, II.*
63. *The Book of Specific Properties* (al-khawāṣṣ).
64. *The Book of Reminder*^z (at-tadhkīr).
65. *The Book of the Garden* (al-bustān)^{zz}.
66. *The Book of Torrents* (as-suyūl).
67. *The Book of the Spirituality of Mercury* (rūḥānīyat ‘Uṭārid).
68. *The Book of Completion* (al-istitmām).
69. *The Book of Species* (al-anwā’).
70. *The Book of the Proof* (al-burhān).
71. *The Great Book of Substances* (al-jawāhir).
72. *The Book of Tinctures* (al-aṣbāgh).
73. *The Great Book of the Perfume* (at-rā’iḥa).
74. *The Elegant Book of the Perfume.*
75. *The Book of the Sperm* (al-manī).
76. *The Book of Clay* (aṭ-ṭīn)^a.
77. *The Book of Salt* (al-milḥ)^b.
78. *The Book of the True (and) Most High Stone* (al-ḥajar al-ḥaqq al-a’zam).
79. *The Book of Milks* (al-albān).
80. *The Book of Nature* (aṭ-ṭabī’a).
81. *The Book of Metaphysics* (mā ba’d aṭ-ṭabī’a).
82. *The Book of Reflexion (of Light, at-talmī’).*
83. *The Book of the Proud* (al-fākhir).
84. *The Book of the Submissive* (aḍ-ḍārī’)^c.
85. *The Book of the Lustre of the Sword* (al-ifrind)^d.
86. *The Book of the Truthful One* (aṣ-ṣādiq).
87. *The Book of the Luxuriant Garden* (ar-rauḍa).
88. *The Book of the Flowering One* (az-zāhir).
89. *The Book of the Crown* (at-tāj).
90. *The Book of the Mountains* (al-jibāl)^e.
91. *The Book of Preface to Knowledge* (taqdimat al-ma’rifa).
92. *The Books of the Arsenics* (az-zarānīkh).
93. *The Book Ilāhī.*
94. *The Book for Khāṭif.*
95. *The Book for Jumhūr al-Qariḥī^f.*
96. *The Book for ‘Alī Ibn Yaqlīn.*

^z Or ‘ Rendering Masculine ’ (Holmyard).

^{zz} p. 356, 11: *al-bustān*, S: *as-sinān*, ‘ the whetstone ’, K.

^a p. 356, 13: *aṭ-ṭīn*, K: *aṭ-ṭair*, ‘ the birds ’, S.

^b S has *al-mulāḥ*, ‘ the witticisms ’, fully vocalized.

^c p. 356, 15: *aṣ-ṣāri’*, S: *aḍ-ḍārī’*, K.

^d *al-ifrind*, S: *al-ifrīk* (without dots), K.

^e p. 356, 16: *al-khayāl*, ‘ the phantom ’, Flügel: in K and S without dots.

^f p. 356, 17: *al-Firanjī*, ‘ the Frank ’ (!), Flügel: in K and S without dots.

97. *The Book of the Sown Fields of the Art* (mazāri' aṣ-ṣinā'a).
98. *The Book for 'Alī ibn Iṣḥāq al-Barmakī*.
99. *The Book of Transmutation* (at-taṣrīf).
100. *The Book of Guidance* (al-hudā) ^g.
101. *The Book of the Softening of Stones* (talyīn al-ḥijāra) for *Manṣūr ibn Aḥmad al-Barmakī*.
102. *The Book of the Aims of the Art* (aḡhrād aṣ-ṣan'a) for *Ja'far ibn Yaḥyā al-Barmakī*.
103. *The Book of the Faint Colour* (al-bāḥit).
104. *The Book of the Aim of Aims* (ḡharaḍ al-aḡhrād).
- 105-12. (*Desunt*.)

These are One Hundred and Twelve Books: and by him thereafter are Seventy Books, namely:

113. *The Book of Divinity* (al-lāhūt).
114. *The Book of the Gate* (al-bāb) ^h.
115. *The Book of the Thirty Words* (ath-thalāthīn kalima).
116. *The Book of the Sperm* (al-manī).
117. *The Book of Guidance* (al-hudā).
118. *The Book of Attributes* (aṣ-sifāt).
119. *The Book of the Ten* (al-'ashara).
120. *The Book of the Epithets* (an-nu'ūt).
121. *The Book of the Bond* (al-'ahd).
122. *The Book of the Seven* (as-sab'a).
123. *The Book of the Living* (al-ḥayy).
124. *The Book of Government* (al-ḥukūma).
125. *The Book of Eloquence* (al-balāgha).
126. *The Book of Likeness* (al-mushākala).
127. *The Book of the Fifteen* (khamsat 'ashar).
128. *The Book of the Equal* (al-kaf').
129. *The Book of Comprehensive Knowledge* (al-iḥāṭa).
130. *The Book of the Filter* (ar-rāwūq).
131. *The Book of the Cupola* (al-qubba) ⁱ.
132. *The Book of Regulation* (aḍ-ḍabt).
133. *The Book of Trees* (al-ashjār).
134. *The Book of Gifts* (al-mawāhib).
135. *The Book of the Necklace* (al-mikhnaqa).
136. *The Book of the Crown* (al-iklīl).
137. *The Book of Refined Metal* (al-khilāṣ).
138. *The Book of the Worthy* (al-wajīh).

^g p. 356, 18: *al-hudā*, S: *al-Hindi*, 'the Indian', K.

^h p. 356, 21: *al-bāb*, S, without dots: *an-nabāt*, 'the plants', K.

ⁱ p. 356, 24: *al-qubba*, K and S, without dots.

139. *The Book of Desire* (ar-*raghba*).
140. *The Book of Creation* (al-*khilqa*).
141. *The Book of the Gift* (al-*hiba*)^k.
142. *The Book of the Luxuriant Garden* (ar-*rauḍa*).
143. *The Book of the Pure* (an-*nāṣi'*).
144. *The Book of Criticism* (an-*naqd*).
145. *The Book of the Pure* (aṭ-*tāhir*).
146. *The Book of the Night* (al-*laila*)^l.
147. *The Book of Advantages* (al-*manāfi'*).
148. *The Book of the Game* (al-*lu'ba*).
149. *The Book of Origins* (al-*maṣādir*).
150. *The Book of Collection* (al-*jam'*).
- 151-2. (*Desunt*.)

These make Forty out of the Seventy Books, then follow :

153-62. (41-50) Epistles on Stones, I-X, without special names.

Thereafter are by him :

163-72. (51-60) Ten Epistles on Plants, I-X, and further

173-82. (61-70) Ten Epistles on Stones, I-X.

That makes Seventy Epistles.

Then follow Ten Books as Supplement of the 'Seventy', namely :

183. *The Book of Emendation* (at-*taṣḥīḥ*).
184. *The Book of the Meaning* (al-*ma'nā*).
185. *The Book of Elucidation* (al-*idāḥ*).
186. *The Book of Intention* (al-*himma*) (357).
187. *The Book of the Balance* (al-*mīzān*).
188. *The Book of Harmony* (al-*ittifāq*).
189. *The Book of the Condition* (ash-*shart*).
190. *The Book of the Remainder* (al-*faḍla*).
191. *The Book of the End* (at-*tamām*)^m.
192. *The Book of the Aims* (al-*aghṛād*).

Thereafter are by him, following the former books, Ten Discourses ; namely :

193. *Emendations of PYTHAGORAS*.
194. *Emendations of SOCRATES*.
195. *Emendations of PLATO*.
196. *Emendations of ARISTOTLE*.
197. *Emendations of ARCHIGENES* (Arshighānis).
198. *Emendations of ARCHIGENES* (Arkāghānis).
199. *Emendations of HOMER*.

^k p. 356, 26 : al-*hai'a*, Flügel : al-*haiya*, S : al-*hiba*, K.

^l K and S have *laila* without the article.

^m p. 357, 1 : at-*tamām*, S : at-*thimār*. 'the fruits', K.

200. *Emendations of DEMOKRITOS.*

201. *Emendations of ḤARBĪ* ⁿ.

202. *Emendations of ours (i.e., of JĀBIR's own writings).*

Then follow Twenty Books with special titles, namely :

203. *The Book of the Emerald* (az-zumurrud).

204. *The Book of the Pattern* (al-anmūdḥaj).

205. *The Book of the Blood of the Heart (Life-Blood or Soul)*, (al-muhja).

206. *The Book of Secrets* (al-asrār).

207. *The Book of the Distant* (al-ba'īd).

208. *The Book of the Exquisite* (al-fādil).

209. *The Book of the Cornelian* (al-'aqlīqa).

210. *The Book of the Crystal* (al-billaura).

211. *The Book of the Resplendent* (as-sāṭi').

212. *The Book of Illumination* (al-ishrāq).

213. *The Book of Symptoms* (al-makhāyil).

214. *The Book of Rivalry* (at-tafāḍul).

216. *The Book of Ambiguity* (at-tashābuh).

217. *The Book of Interpretation* (at-tafsīr).

218. *The Book of Distinction* (at-tamyīz).

219. *The Book of Perfection and Completion* (al-kamāl wa t-tamām).

220-2. (*Desunt.*)

Then there follow Three Books :

223. *The Book of the Secret Thought* (aḍ-ḍamīr).

224. *The Book of Purity* (aṭ-ṭahāra).

225. *The Book of the Aims* (al-aghrād) ^o.

And thereafter Seventeen Books, the first of which is :

226. *The Book of the Beginning of the Performance* (al-mubtada' bi r-riyāḍa).

227. *The Book of the Introduction to the Art* (al-madkhal ilā ṣ-ṣinā'a).

228. *The Book of Suspension of Judgment* (at-tawaqquf).

229. *The Book of Confidence in the Truth of Science* (ath-thiqa bi-ṣiḥḥat al-'ilm).

230. *The Book of Mediation in the Art* (at-tawassuṭ fī ṣ-ṣinā'a).

231. *The Book of the Test* (al-miḥna).

232. *The Book of Reality* (al-ḥaqīqa).

233. *The Book of Harmony and Discord* (al-ittifāq wa l-ikhtilāf).

234. *The Book of Evidence and Perplexity* (at-tabyīn ^p wa l-ḥaira).

235. *The Book of the Balances* (al-mawāzīn).

236. *The Book of the Obscure Secret* (as-sirr al-ghāmīḍ).

ⁿ p. 357, 5 : Ḥarbī, S : Ḥarī, K.

^o p. 357, 10 : al-a'rāḍ, 'the accidents', Flügel, K : in S without dots.

^p p. 357, 13 : as-sunan, Flügel : in K and S without dots ; emended by Plessner.

237. *The Book of the Furthest Attainable End* (al-mablagħ al-aqṣā).
238. *The Book of Disagreement* (al-mukhālafa).
239. *The Book of Commentary* (ash-sharḥ).
240. *The Book of the Aims concerning the Ultimate End* (al-aghrād fī a n-nihāya).
241. *The Book of Thorough Examination* (al-istiṣāʾ).
242. (*Deest.*)

Then follow Three Books :

243. *The Book of Purity* (aṭ-ṭahāra), other than that mentioned above.
244. *The Book of Confidence* (ath-thiqa) ^r.
245. *The Book of the Aims* (al-aghrād) ^s.

Says MUḤAMMAD IBN ISḤĀQ : JĀBIR says in his *Catalogue*: ' After these books, I composed Thirty Epistles with special titles (246-75). Then I composed Four Discourses, namely :

276. *The Book of the First Active* (al-fāʾila) *Mobile Nature* (aṭ-ṭabīʿa), i.e., *Fire*.
277. *The Book of the Second Active Immobile Nature*, i.e., *Water*.
278. *The Book of the Third Passive Dry Nature*, i.e., *Earth*.
279. *The Book of the Fourth Passive Moist Nature*, i.e., *Air*.

Says JĀBIR : To these books belong Two (other) Books containing the commentary thereof, namely :

280. *The Book of Purity*.
281. *The Book of Aims* (al aghrād) ^t.

Thereafter I composed Four Books, namely :

282. *The Book of Venus* (az-Zuhara).
283. *The Book of Comfort* (as-salwa).
284. *The Book of the Perfect* (al-kamil).
285. *The Book of Life* (al-ḥayāt).

Thereafter I composed Ten Books according to the opinion (*ra'y*) of APOLLONIUS (*Balīnūs*), Master of Talismans, namely :

286. *The Book of Saturn* (Zuḥal).
287. *The Book of Mars* (al-Mirrīkh).
288. *The Greater Book of the Sun*.
289. *The Smaller Book of the Sun*.
290. *The Book of Venus* (Zuhara).
291. *The Book of Mercury* ('Utārid).

^a p. 357, 14: *fī* is in S erroneously twice written.

^r p. 357, 15: *at-tafsīr*, 'the commentary', K without dots: *ath-thiqa*, S (without dots except for the *q*).

^s *al-a'rāḍ*, 'the accidences', Flügel, K, and S.

^t p. 357, 20: '*al-a'rāḍ*', 'the accidences', Flügel and S; in K without dots.

292. *The Greater Book of the Moon.*

293. *The Book of the Aims* (al-aghrād) ^u.

294. A book known as *The Book of Inherent Virtue, of its Essence* (khāṣṣiyat nafsihi).

295. *The Book of Jupiter* (al-Mushtarī) ^v.

To him (JĀBIR, also) belong Four Books on the *Hidden Treasures* :

296. *The Book of the Result* (al-ḥāṣil).

297. *The Book of the Racecourse of the Mind* (maidān al-‘aql).

298. *The Book of the Quintessence* (al-‘ain).

299. *The Book of the Pleiads (or Arrangement)* (an-naẓm).

Says ABŪ MŪSĀ (*i.e.*, JĀBIR): I composed 300 books on Philosophy and 1300 books on Automata (*al-ḥiyal*) ⁴⁴ after the way of the Book of *Taqāṭur* ^{w 45} and 1300 epistles on ^x Crafts (*aṣ-ṣanā’i’*), and War-Engines (*ālāt al-ḥarb*). Then I composed on Medicine an important book ⁴⁶ and composed (other) books small and large, and I composed on Medicine (altogether) about 500 books as, *e.g.* :

300. *The Book of the Pulse and Anatomy.*

Then I composed :

301. *The Book on Logic according to the opinion* (ra’y) *of ARISTOTLE.*

Then I composed :

302. *The Elegant Book of Astronomical Tables*, about 300 folios.

303. *The Book of Commentary on EUCLID.*

304. *The Book of Commentary on the Almagest.*

305. *The Book on Mirrors.*

306. *The Book of the Greedy* (al-jārūf), against which the Theologians (al-mutakallimūn) wrote refutations. It is also said to be by Abū Sa’id al-Miṣrī.

Then I composed books on Asceticism (az-zuhd) and sermons (al-mawā’iz), and I composed books on *Nīranjāt* ⁴⁷, and I composed (358) many books on matters that act by their specific properties ⁴⁸. Then I composed 500 books to refute the philosophers ; then I composed a book on the Art, known as the *Book of the Kingdom* (al-mulk) ⁴⁹, and another book, known as the *Book of the Luxuriant Gardens* (ar-riyād) ^{50, 51}.

^u p. 357, 23 : *al-a’rād*, ‘ the accidents ’, Flügel and K ; in S without dots. Here ends the first hand of codex S. What follows in S is added by another copyist who copied the missing part up to the end of the book from codex K ; see Ritter in *Der Islam*, 1928 xvii, 21.

^v p. 357, 19 : read with Ruska *al-Mushtarī* instead of *al-muthannā* of K (without vowel-signs).

^w In K without dots.

^x p. 357, 26 : *fī* is missing in K.

§ 13. DHŪ N-NŪN AL-MIṢRĪ ⁵².

This is ABŪ L-FAID DHŪ N-NŪN IBN IBRĀHĪM ; he was a Sufi and has left (his) traces in the Art and books written (thereon). To his books belong :

1. *The Greatest Book of the Pillar.*
2. *The Book of Confidence in the Art.*

§ 14. AR-RĀZĪ MUḤAMMAD IBN ZAKARĪYĀ' ⁵³.

His place in philosophy and medicine is renowned and famous, and I have sufficiently dealt with him in the chapter on medicine. He believed in the truth of the Art and composed many books on it, amongst them a book comprising the following twelve books :

1. *The Book of Instructive Introduction* (al-madkhal at-ta'limī).
2. *The Book of Argumentative Introduction* (al-madkhal al-burhānī).
3. *The Book of the Proofs* (al-ithbāt).
4. *The Book of the Process* (at-tadbīr).
5. *The book of the (Philosophers') Stone.*
6. *The Book of the Elixir.*
7. *The Book of the Nobility* (sharaf) *of the Art.*
8. *The Book of Arrangement* (at-tartīb).
9. *The Book of the Processes* (at-tadābīr).
10. *The Book of the Subtleties of the Mystical Sayings* (nukat ar-rumūz).
11. *The Book of the Test* (al-miḥna).
12. *The Book of Devices* (al-ḥiyal).

Other books of his on the Art are :

13. *The Book of Secrets* (al-asrār).
14. *The Book of the Secret of Secrets* (sirr al-asrār).
15. *The Book of Division into Chapters* (at-tabwīb).
16. *The Epistle on Specific Property.*
17. *The Book of the Yellow* (al-aṣfar) *Stone.*
18. *The Epistles of the Kings.*
19. *The Book of Refutation of AL-KINDĪ's Refutation of the Art.*

§ 15. IBN WAḤSHĪYA ⁵⁴.

ABŪ BAKR AḤMAD IBN 'ALĪ IBN QAIS IBN AL-MUKHTĀR IBN 'ABDALKARĪM IBN ^u the Chaldean, from Junbulā and Qussīn⁵⁵, a Nabatean ⁵⁶, who had a perfect command over the Chaldean language. We have dealt with his activities sufficiently in the *Eighth Discourse* in the *Section on Sorcery* (siḥr), *Witchcraft* (ash-sha'badha), and *Incantations* (al-'azā'im) ⁵⁷ : for he was clever in it. Here we shall mention his books on Alchemy, namely :

^u p. 358, 15 : here K has some corrupt names : *Ḥarb ibn Nadīb ibn Būrāṭyā*, all without dots or vowel-signs.

1. *The Great Book of the Principles* (uṣūl), concerning the Art.
2. *The Small Book of the Principles, concerning the Art.*
3. *The Book of Graduation* (al-mudarraja) ⁵⁸.
4. *The Book of Discourses* (al-mudhākārāt) on the Art.
5. *A Book comprising Twenty Books, in serial order.*

A copy of the Alphabets ⁵⁹, in which the books of the Art and of Sorcery (siḥr) are written, and which IBN WAḤSHĪYA mentions, I have read in his own handwriting, and I have seen a copy of the very same alphabets in a number of pamphlets written by ABŪ L-ḤASAN IBN AL-KŪFĪ ⁶⁰ which contained grammatical and syntactical glosses, stories, poems and traditions, and which along with the books of the BANŪ L-FURĀT ⁶¹, had passed into the hands of ABŪ L-ḤASAN IBN AL-FATH ^z ⁶². And this was one of the finest specimens of the handwriting of IBN AL-KŪFĪ that I have ever seen, after the *Book of Vices of the common People* by ABŪ L-‘ANBAS AṢ-ṢAIMARĪ ⁶³.

1. *The Al-Fāqītūs-alphabet* ^a ⁶⁴.
2. *The Musnad-alphabet* ^a ⁶⁵.

These are the characters in which one finds the Old Sciences written in the (Egyptian) temples.

3. *The ‘Anbath -alphabet* ^b ⁶⁶.

These ⁶⁷ alphabets are frequently used in the books on the sciences which I have mentioned, namely Alchemy, Sorcery and Incantations, in the language of those people who invented the respective science; so that they are unintelligible, *nota bene*, unless a man be familiar with that language, which very seldom happens. But often these alphabets are only ciphers to be transliterated into the Arabic language (*i.e.*, alphabet), and so one has only to think it over and to make these characters correspond with those (of the Arabic alphabet) and by doing so return to them (the original texts),—if Allāh willeth! (359).

§ 16. AL-IKHMĪMĪ ⁶⁸.

His name is ‘UTHMĀN IBN SUWAID ABŪ ḤARĪ AL-IKHMĪMĪ, from Ikhmīm, an Egyptian town. He was advanced in the Alchemical Art and a leader in it. He had controversies with IBN WAḤSHĪYA and corresponded with him.

His books are:

1. *The Book of the Red Sulphur* (al-kibrīt al-aḥmar).
2. *The Book of Exposition* (al-ibāna).
3. *The Book of Emendations* (at-taṣḥīḥāt).
4. *The Book of the Deflection from Dhū n-Nūn al-Miṣrī of Imputations (against him).*

^z p. 358, 23 : at-Tanḥ, Flügel and K, without vowel-signs.

^a Here in K, the letters of the Arabic alphabet are written down.

^b Here K does not give even the Arabic alphabet.

5. *The Book of Glosses* (at-ta'liqāt).
6. *The Book of Instruments of the Ancients* (ālāt al-quḍamā').
7. *The Book of Dissolving and Fixation* (al-ḥall wa l-'aqd).
8. *The Book of the Process* (at-tadbīr).
9. *The Book of Sublimation and Distillation* (at-taṣ'īd wa t-taqtīr).
10. *The Book of the Greatest Glow or Hottest Fire* (al-jahīm al-a'zam).
11. *The Book of the Controversies and Conferences of the Scholars*.

§ 17. ABŪ QIRĀN ⁶⁹.

This man hailed from Nisibis ; he was one of those who are believed to have succeeded in the Alchemical Art, and those whom the adepts of this Art refer to, prefer, and consider eminent. IBN WAḤSHĪYA has mentioned him. By him are the following books :

1. *Commentary on JĀBIR's 'Book of Mercy'*.
2. *The Book of Ferments*.
3. *The Book of Ripeness* (al-bulūgh).
4. *The Book of the Commentary on the Ether* (sharḥ al-athīr) ^e.
5. *The Book of Emendations*.
6. *The Book of the Eggs*.
7. *The Book of the Sevenfold Purple* (al-firfir al-musabba') ^d.
8. *The Book of Advice* (al-ishāra).
9. *The Book of Watering* (at-tamwīh).

§ 18. STEPHANUS the Monk ⁷⁰.

This man lived in Mosul in a convent ⁷¹ that was called ^e Michael's (Monastery). People said about him that he practised Alchemy. When he died, his books came to light in Mosul. I saw some of them, namely :

1. *The Book of Right Guidance* (ar-rushd).
2. *The Book of What we invented* (mā aḥdathnāhu) ^f.
3. *The Book of the Greatest Gate* (al-bāb al-a'zam).
4. *The Book of Prayers and Sacrifices to be performed before (practising) the Alchemical Art*.
5. *The Book of the Astrological Selection (of auspicious days) for practising the Art* ^g.
6. *The Book of Glosses*.
7. *The Book of the Hours and Times* (al-auqāt wa l-azmina).

^e p. 359, 10 : in K without dots.

^d p. 359, 11 : Flügel *al-farqain al-musabba'* : in K without dots.

^e p. 359, 13: K has *wayusammā*, 'and he was called (Michael)'; but the reading of L and Flügel, *yūqālu lahū*, 'which was called Michael's monastery', is preferable.

^f p. 359, 14: *mā ḥaddathnāhu*, 'what we told', Flügel : in K without dots.

^g This title is given by Flügel and L ; it is missing in K.

§ 19. AS-SĀ'IH AL-'ALAWĪ ⁷².

Abū Bakr 'Alī ibn Muḥammad al-Khurāsānī al-'Alawī aṣ-Ṣūfī, one of the descendants of Ḥasan ibn 'Alī,—Prayers be upon them! ^h,—succeeded in the Art, at least according to the information given by the adepts of this Art. He roamed about from country to country as he was afraid the government would attempt his life. I have not seen anybody who knew him personally: but his books have come to us from Media. He composed:

1. *The Epistle of the Orphan* (al-yatīm).
2. *The Book of the Pure Stone* (al-ḥajar aṭ-ṭāhir).
3. *The Book of the Useful Humble One* (al-ḥaqīr an-nāfir').
4. *The Book of the Hidden (?) Pure One* (aṭ-ṭāhir al-khafī) .
5. *The Book of the Principles* (al-uṣūl).
6. *The Book of the Hair, Blood, Eggs, and the Use of their Waters.*

§ 20. DUBAIS, the Disciple of AL-KINDĪ ⁷³.

He is MUḤAMMAD IBN YAZĪD, known as DUBAIS ⁷⁴, one of those who dealt with the Art and the External Practices. By him are the following books:

1. *The Book of the Collector* (al-jāmi').
2. *The Book of the Making of Dyes, and of Black and Coloured Ink.*

§ 21. IBN SULAIMĀN ⁷⁵.

He is ABŪ L-'ABBĀS AḤMAD IBN MUḤAMMAD IBN SULAIMĀN; he is said to be an Egyptian; it has not become known to us that he succeeded in the Art. The following of his books have come to this country:

1. *The Book of Explanation and Exposition, with regard to External Practices.*
2. *The Book of the External Practices.*
3. *The Book of the Amalgams.*
4. *The Book of the Electuaries* (al-ma'jūnāt).
5. *The Book of Fermentation* (at-takhmīr).

It is said that the *Book of Explanation and Exposition* is by IBN 'IYĀD AL-MIṢRĪ ⁷⁶, the disciple of JĀBIR (360).

§ 22. ISḤĀQ IBN NUṢAIR.

ABŪ IBRĀHĪM IBN NUṢAIR was a man who dealt with the Art. He understood how to make a thing glossy ⁷⁷ and to make glass; by him are:

1. *The Book of Making Things Glossy and of Glassy Fluxes.*
2. *The Book of the Making of Precious Pearls* ⁷⁸ .

^h p. 359, 18: Here again K has the Shī'itic eulogy, whilst Flügel has the Sunni formula May Allāh be pleased with them!

ⁱ p. 359, 22: *al-khafī*, Flügel and L: *al-Ḥanafī*, K without dots.

§ 23. IBN ABĪ L-'AZĀQIR ⁷⁹.

ABŪ JA'FAR MUḤAMMAD IBN 'ALĪ ASH-SHALMAGHĀNĪ ; I have sufficiently dealt with him in the chapter on the Shī'ites. He was advanced in the Alchemical Art ; and by him are :

1. *The Book of Ferments.*
2. *The Book of the (Philosophers') Stone.*
3. *The Commentary on JĀBIR's Book of Mercy.*
4. *The Book of the External Operations.*

§ 24. AL-KHANSHALĪL ⁸⁰.

He is ABŪ L-ḤASAN AḤMAD, and AL-KHANSHALĪL is his surname. He was a friend of mine and assured me several times that he was successful in the Art ; but I could not notice anything of this kind in him ; for I saw him always a poor old man who obviously had not been successful. He was (always) dirty. By him are :

1. *The Commentary on the Subtleties of the Mystical Sayings.*
2. *The Book of the Sun.*
3. *The Book of the Moon.*
4. *The Book of the Faithful Friend of the Poor* (mus'if al-fuqarā').
5. *The Book of the Work at the Head of the Furnace* (al-a'māl 'alā ra's al-kūr).

§ 25. Final Remarks.

Says MUḤAMMAD IBN ISḤĀQ : The Books that have been composed on this subject are too numerous and too extensive to be recorded, because their authors plagiarize them ⁸¹. Amongst the Egyptians there are authors and scholars in this field, and the discussion on the Art began there ; the well-known temples (*al-barābī*) ⁸², i.e., houses of wisdom, and MARY ⁸³, are from Egypt. But is it also said that the discussion on the Art originated from the 'first Persians' ⁸⁴, (while) according to others, the Greeks were the first who dealt with it, or the Indians, or the Chinese ⁸⁵. Allah knows best (what is the truth) !

Here endeth the *Tenth Discourse* of the *Book of the Catalogue*, and with this the whole book has come to an end.

And to Allāh belongs Praise and Grace and Power and Might ! And May the Blessing and Mercy of Allāh be upon our Lord Muḥammad and his family !

COMMENTARY.

§ 1.

1. On HERMES, see § 2.
2. *khawāss* means 'Specific Properties' (cf., e.g., *Rasā'il Ikhwān aṣ-ṣafā'*, Cairo, 1928, i, 71). *Rūḥānīyāt*, lit. 'Spiritualities', are the spiritual forces or *pneumata* which, originating in the active Intellect, pervade the universe

and through the agency of the planets are working upon the sublunary world of generation and corruption and its minerals, plants and animals; see, e.g., *Rasā'il Ikhwān aṣ-ṣafā'*, ii, 124 *seq.* According to W. Scott, (*Hermetica*, iv, 285, n. 6) 'the use of *pneuma* and its derivatives in place of the Platonic and Hermetic *nous* and its derivatives is usually a mark of Jewish or Christian influence'.

3. *Aṣhāb al-qidam* are philosophers who, like Aristotle, held that the world has no beginning. They had no difficulty in attributing the use of talismans to the remotest past, whilst those who, in accordance with the *Qur'ān*, maintained that the world had been created by Allāh, had to keep within the narrow limits of established chronology which placed the creation of the world at about 5326 years before Muḥammad.

4. On AR-RĀZĪ, see § 14.

5. Jewish legends represent Korah as immensely rich, see *Jewish Encyclopædia*, vii, 556 *seqq.* In the *Qur'ān*, *Sura xxviii*, 78, he boasts that his boundless treasures were given to him only on account of the knowledge he possessed. It was natural that, later on, these words seemed to imply to some people that he understood the art of making gold, so that AR-RĀZĪ in his *Kitāb al-asrār* can mention him amongst the earliest Alchemists (see Steinschneider, *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, 1904, lviii, 309).

6. In AR-RĀZĪ's *K. al-Asrār*. (See Stapleton, Azo, and Ḥusain, 'Chemistry in 'Irāq and Persia in the Tenth Century A.D.', *Memoirs of the Asiatic Society of Bengal*, viii, 335.)

7. *ḥikāya*, 'slander', is *nomen verbi* to *ḥāka* 'alaihi, see, e.g., a verse of UḤAIḤA IBN AL-JULĀḤ, quoted by Lane 2145, and the references given by Fischer und Bräunlich, *Schawāhid-Indices* 36, 1.5.

§ 2.

8. This Section on Hermes was translated by W. Scott, *Hermetica*, iv, 255 *seq.* (based on the German translation given by Chwolsohn, *Die Ssabier*, i, 788) and, together with § 3, by Stapleton and Ḥusain, 'Three Arabic Treatises on Alchemy' in *Memoirs of the Asiatic Society of Bengal*, xii, 121. Sections two and three are, with some slight omissions, quoted by AL-MAQRĪZĪ in the chapter on the Pyramids, which was edited and translated by E. Graefe, 'Das Pyramidenkapitel' (*Leipziger Semitistische Studien*, v (5), 14 (Arabic text) and 61 (German translation)).

An-Nadīm does not mention the source of the information about Hermes which he imparts to the reader in this and the preceding Sections. It may be that he relied on the authority of AR-RĀZĪ whom he quotes in § 1. A comparison with Ibn Ṣā'id, *Les catégories des nations* (publ. p. L. Cheikho, Beirut, 1912, 18), with IBN AL-QIFṬĪ's *Ta'rīkh al-ḥukamā'* (ed. J. Lippert, p. 346) and with IBN ABĪ UṢAIBI'A's *Anbā' al-abnā'* (i, 16) shows that the ultimate source was the *Book of Chiliads* (*kitāb al-ulūf*), a book

dealing with the religions and cults of different nations, and their places of worship, written by the well-known astrologer ABŪ MA'SHAR (Albumasar) who died in A.H. 272/A.D. 886. There can be hardly any doubt that ABŪ MA'SHAR, in giving information about different Sages called HERMES, reproduced notions prevalent in his time, *i.e.*, about A.D. 860, amongst the so-called Šābians of Ḥarrān. The Ḥarrānians were, as is well known, worshippers of the planets. When in A.H. 218/A.D. 833 the Caliph AL-MA'MŪN on his way to Asia Minor (where he was to fight the Byzantines and eventually to die) passed through Ḥarrān and saw these heathen, he threatened to exterminate them unless they gave up their polytheism. The Ḥarrānians, however, denied being polytheists and claimed that their religion was that of the Šābians, a forgotten sect mentioned in the *Qur'ān*; and, by bribing the Muslim officials, they succeeded in obtaining recognition as a community entitled to protection (in the same way as the Jews, the Christians, and the Zoroastrians). It seems that, for the same reason, they suggested that their own prophets, AGATHODAIMON and HERMES, were identical with Muslim prophets, viz. :—AGATHODAIMON with SETH, and HERMES with IDRĪS, a prophet mentioned in the *Qur'ān*, who in his turn was believed to be the same as ENOCH. They also asserted that the great Pyramids were the tombs of these two prophets. They further produced books whose contents they claimed had been revealed to their prophets, *e.g.*, the book of HERMES, *De Castigatione Animae*. The Arabic text of this was published, with a Latin translation, by Otto Bardenhewer, Bonn, 1873; while the gist of it has been rendered into English by W. Scott, *Hermetica*, iv, 277–352.

The Muslim authors of the Middle Ages had some vague recollections of the power of the Chaldean Empire. In his *Tanbih* (Bibliotheca Geographorum Arabicorum, viii) MAS'ŪDĪ, who died in A.H. 345/A.D. 956, classifies the Chaldeans (whom he also calls Syrians) as well as the Indians and Chinese among the ancient nations. They inhabited 'Irāq and ruled over the First Persians. Amongst their tribes and clans, he mentions (pp. 78 *seqq.*) the Ninivites, Assyrians, Armenians, Nabateans and the *Jarāmiqa*, *i.e.*, the aboriginal population of the Mosul district. Their kingdom extended over 'Irāq, Diyār Rabī'a, Diyār Muḍar, Diyār Bakr, Syria and the Arabian peninsula. Throughout this kingdom, Syriac, 'the language of Adam', was used as a means of communication. At the time of MAS'ŪDĪ (p. 161) the remnants of the Chaldeans, or Babylonians, were still living in the swamps (*Baṭā'ih*) between Wāsiṭ and Baṣra. The historian ḤAMZA AL-ISFAHĀNĪ, who died about 350/961, uses the term Chaldean in an even more general way; for he says they were the inhabitants of the Western half of the world, whilst the Eastern half was populated by Shamanists. The remnants of the Chaldeans were, at the time of ḤAMZA, still to be found at Ḥarrān and Edessa; since the days of the Caliph AL-MA'MŪN, they had called themselves Šābians. Later, the Andalusian ŠĀ'ID (died 462/1069), in his *Classes of the Nations*, is full of

praise for the learning of the Chaldeans, especially in the field of Astrology. It is in accordance with these ideas that the author of the *Fihrist*, in his title to the Ninth Discourse (Flügel, p. 318) states that he is dealing with the tenets of the 'Ḥarrānīan Chaldeans known as Šābians'. In the same Section (p. 321, 30), it is stated that Wednesday was, amongst the Ḥarrānians, dedicated 'to 'Uṭārid, whose name is NĀBŪ' (*Nābuq* of Flügel's edition and the MSS. is apparently due to a scribal error). Nābū is the Babylonian name of the planet Mercury, whilst 'Uṭārid may have belonged to an Aramaic dialect, though no other trace of this word seems to have come down to us. 'Uṭārid is also used as a personal name amongst the Arabs from pre-Islamic days onwards. It should be noted, however, that the philologist IBN DURĀID (in his *Genealogisch-etymologisches Handbuch*, hg. v. F. Wüstenfeld, Göttingen, 1854, 145) considers 'Uṭārid in this sense as a purely Arabic word which means 'tall' or 'high'.

In this way a good deal of Hermetic tradition entered the realm of Islam and was gradually brought to the notice of the Muslim world. But it was not the *Hermetica* alone which reached the Muslims through the channels of Šābian literature. It is well known that the Caliph AL-MA'MŪN (who reigned from A.D. 813 to A.D. 833) was averse to the narrow-minded orthodoxy of his predecessors and favoured the advanced ideas held by the so-called Mu'tazilites on religious matters. He encouraged the study of the 'Ancient Sciences' (*al-'ulūm al-qadīma*), i.e., the sciences cultivated by the Greek philosophers, collected their writings, had them translated into Arabic, built a library, and patronized scholars working in this direction. Mu'tazilism reigned supreme in the caliphate from 212/827 to 237/851; so it was natural that the Ḥarrānians should try to gain favour with the Muslim authorities by emphasizing the connection of their religion with Oriental Hellenism. Their writers, therefore, overlaid the rather crude rituals and sacrifices of their paganism with a network of abstruse theories, and represented Šābianism as a philosophical religion. It was especially the Emanation theory of Neoplatonism which—in combination with Astrology—was made use of in representing the Šābian religion as a lofty system of a very high moral and intellectual order. In this way the old Planet-gods of Ḥarrān were transformed into personal Spiritual Beings (*rūḥānīyūn*) or impersonal spiritual forces (*rūḥānīyāt*) pervading the sublunary world.

9. ṬĀṬ, i.e., the Egyptian god THOTH, the inventor of hieroglyphs, and the patron god of scribes and scholars. Originally he was identified with HERMES, but already in the *Corpus Hermeticum* he is represented as the son of HERMES. ŠĀ' may be the eponymous hero of Šā' al-ḥajar, a place in the Delta, near the famous Sais. Al-Ashmūnain (this dual means Upper and Lower Ashmūn, see *Encyclopædia of Islam*, s.v.), was the famous city of Thoth, called by the Copts Shmun and by the Greeks Hermopolis. Atrīb, the Athribis of the Greeks, is situated in the Girge province, near Sohag. Qift (see *Encyclopædia of Islam*, s.v.) is the name of the once famous emporium Koptos in Upper Egypt.

10. *Abū Hirmis* means 'the father of HERMES'. On *Haram*, 'pyramid', see *Encyclopædia of Islam*, s.v. The word *haram* is of Coptic origin and has no connection with the name of HERMES.

§ 3.

11. For translations of this Section, see note no. 8.

12. This highly cultured family is mentioned in the *Fihrist*, p. 120 (Flügel). They were of Christian extraction but had embraced Islam. During the third and fourth centuries A.H. (ninth and tenth centuries A.D.) some of them were holding high posts in the Abbāsīd administration.

13. According to AL-MAS'ŪDĪ, *kitāb at-tanbih* (*Bibliotheca Geographorum Arabicorum*, edidit M. J. de Goeje, 1894, viii, 22), one Hāshimite cubit is equal to $1\frac{1}{3}$ ordinary cubits, that is to say, about 0.64 m. The actual length of the sides of the Great Pyramid at its base is 227.5 m., and was originally a few metres larger; it, therefore, seems that the value of the ordinary cubit, *i.e.*, 0.48 m., would fit much better. For the platform on the top of the pyramid, actually measuring 10 m. square, the value of 40 cubits square is at all events erroneous.

14. This passage on the *Barābī*, p. 353, 3-7, has been translated by R. A. Nicholson in the *Journal of the Royal Asiatic Society*, 1906, 309.

15. *Barbā*, (pl. *barābī*) is the Coptic *p'erpe*, 'temple', and is used by Muslim writers when speaking of the ruins of Egyptian temples; see *Encyclopædia of Islam*, s.v. *Barbā*.

16. Abū Ma'shar in his *Book of the Differences of the Astronomical Tables* (*ikhtilāf az-zījāt*), quoted in the *Fihrist*, p. 240, 8 (Flügel), defines *tūz* as the inner bark (*liḥā*) of the *khadang*-tree, and adds that, owing to its solidity and smoothness, it was used by the Kings of Persia as writing material; he also states that it was wrapped round bows. According to Shakspeare *apud* Vullers, *Lexicon Persico-Latinum*, i, 663, and Richardson *apud* Dozy, *Supplément*, i, 154, *khadang* is the white poplar, according to others the black poplar, whilst Dozy doubts whether this tree is a poplar at all.

17. This is apparently a reference to books on Pneumatic Magic, an occult science based on the following assumptions: (1) that the stars and their constellations have influence over the sublunary world; (2) that every thing existing is unalterably characterized by its specific properties; and (3) that the universe is pervaded by incorporeal spiritual (*i.e.*, 'pneumatic') forces. From these assumptions resulted the belief that it is possible, on a strictly scientific basis, to combine these scattered *pneumata* and direct them to the ends desired by the magician. Amongst the means by which it was sought to accomplish the aim of this science, were the *Nīranjāt*—from Persian *nīrang*, 'charm, spell, philtre, phantasmagory, trickery'—by which here are meant magic potions, the ingredients of which were made to carry spiritual powers. In the section on 'Jugglers' Trickery' (*sha'badha*), Talismans, and *Nīranjāt*, AN-NADĪM

mentions (p. 312, 26) 'the books of HERMES on *Nīranjāt*, Specific Properties (*al-khawāṣṣ*) and talismans, viz.—(1) the Book of Hermes on Charms against Maladies (*an-nushar*), on Amulets (*at-ta'āwīdh*), and on Incantations (*al-'azā'im*), and (2) *The Book of AL-HĀRĪṬŪS on the Nīranjāt of trees, fruits, greases (al-adhān) and herbs (al-hashā'ish)*, which is also mentioned in § 4, no. 6. A large number of *Nīranjāt* together with their recipes are given in the *Ghāyat al-ḥakīm*, a handbook on magic, ascribed to al-Majrīṭī (ed. H. Ritter, pp. 248–64). The latin version of this is known by the title *Picatrix* (=Hippocrates); see H. Ritter, 'Picatrix, ein arabisches Handbuch hellenistischer Magie' in *Vorträge der Bibliothek Warburg*, 1921–2, Leipzig, 1923, 94–124.

The books of Hermes on Astronomy are enumerated in the *Fihrist*, p. 267, 12–15 (Flügel).

§ 4.

18. A German translation of this Section has been given by Julius Ruska, *Tabula Smaragdina*, p. 65. Here I add a few remarks on the titles.

(1) and (3) These two books deal with Alchemy and, therefore, have nothing to do with the *Discourses on the belief in the Unity of God*, by HERMES to his Son which are mentioned in the *Fihrist* (p. 320, 8, (Flügel)), on the authority of the philosopher AL-KINDĪ (c. A.D. 870). These *Discourses* are perhaps identical with the *Discourses of Hermes to his disciples Ṭāṭī by way of questions and answers*, fragments of which are mentioned by IBN AL-QIFṬĪ (died 646/1248) in his *Ta' rīkh al-ḥukamā'* (p. 349, Lippert), whilst his younger contemporary BARHEBRAEUS (died 688/1289; in his *Historia Orientalis*, p. 6, Pococke) adds that he possessed a Syriac text of it (see W. Scott, *Hermetica*, iv, 275). These *Discourses* may or may not have been an Arabic translation of a collection of *Hermetica* (as Scott, *op. cit.*, p. 250, n. 2, thinks) similar to those dialogues between HERMES and his son ṬĀṬ which have come down to us (see the references given by Scott, *l.c.*, i, 15). For these alchemical treatises of Hermes to Ṭāṭ, the paper of Stapleton, Lewis and Sherwood Taylor in *Ambix* (1949, iii, 72, 81 and 87) may be consulted.

(2) 'Flowing Gold' means mercury, see J. Ruska and E. Wiedemann, *Beiträge zur Geschichte der Naturwissenschaften*, lxvii, Alchemistische Decknamen in (*Sitzungsberichte der Physikalisch-medizinischen Sozietät zu Erlangen*, 1924–5, lvi–lvii (Erlangen, 1926), 32, n. 8.)

(4) Perhaps a cryptic name. Ruska and Meyerhof prefer to emend *al-'uqūd*, 'the tagging of (magical) knots'.

(5) Forty-five Aphorisms (*fuṣūl*) from a book called 'The Secret of Secrets (*Sirr al-Asrār*) by 'Uṭārid (*i.e.*, Mercury) the Babylonian, containing astrological injunctions, are given in the *Ghāyat al-ḥakīm*, pp. 319–23.

(6) This book is mentioned by AN-NADĪM, p. 312, 27, amongst the writings of Hermes dealing with *Nīranjāt*; see above note 17. It is

quoted in the *Ghāyat al-ḥakīm*, pp. 113, 4 and 270, 14. The idea of de Goeje, *Zeitschrift der Deutschen Morgenländischen Gesellschaft*, xx, 487, that the title means ἄδυστον is not convincing.

(7) Extant in British Museum Arab. MS. 1517. In the *Ghāyat al-ḥakīm*, pp. 248, 2–270, 3, a large number of extracts from this book are given; the book, however, is ascribed by Pseudo-Majrīṭi to Aristotle.

(8) Extant in the *Codex Bodleianus*, Marshall, 556, fol. 111r–52r; long extracts from it are found in the *Ghāyat al-ḥakīm*, 187, 3–193 and 242, 4–246, where it is, however, ascribed to Aristotle.

(9) A book *as-Salmāṭīs* is otherwise unknown; but there exists a *kitāb al-Iṣṭamāṭīs*, ascribed to HERMES, fragments of which are extant in Codex Berol. Petermann, i, 66, and in the Paris MS. *Ancien fonds arabe*, 1167. Large extracts from this book, here again ascribed to Aristotle, are found in the *Ghāyat al-ḥakīm*, pp. 189, 5; 190, 3. See also p. 244, 8.

The reading 'ARMENIOS' is not satisfactory; the correct reading is perhaps AMMON. Excerpts from a collection, containing the teachings of HERMES to AMMON, are extant in the *Eclogæ* of STOBÆUS I, 434 seqq.).

(11) ASKLEPIOS is, in the *Hermetica*, represented as a pupil of HERMES, see W. Scott, *l.c.*, i, 15. Asklepiades, in Arabic texts, occasionally stands for ASKLEPIOS. In Lippert's edition of the abridgment of AL-QIṬĪ's *Ta'rikh al-ḥukamā'*, p. 3, p. 16, the names of the four kings appointed by Hermes over the four parts of the earth are given as follows: the first ĪLĀ'ŪS (which means *ar-Raḥīm*); the second AUS; the third ASCLEPIUS; the fourth AUS AMMŪN, or ĪLĀ'ŪS AMMŪN, or BASILEUS (and that is AMMŪN AL-MALIK). The first name apparently is Helios or Hilaos, the second name represents Zeus, the third Asclepius, and the fourth Zeus Ammon or Helios Ammon.

(12) The Ἀρχαϊκή of HERMES is quoted by ZOSIMOS (see § 6) in a passage, which in its turn is preserved by his commentator OLYMPIODOROS (who probably flourished in the fifth century), in the extracts published by Berthelot, *Collection des anciens Alchimistes grecs*, Paris, 1888, 101, 17. See also Festugière, *La Révélation d'Hermès Trismégiste*, pp. 211–5. The title must not be changed, as does W. Scott, *Hermetica*, iv, p. 151, into ἀρχαιολογική.

§ 5.

19. On OSTANES, see Bidez and Cumont, *Les Mages Hellénisés*, where (in ii, 270) a French translation of this section is given.

Rūm is not Rome or the Romans, but the Greeks of the Lower Empire, and the Byzantines. Already in the *Qur'ān*, *Sura xxx*, 1, Rūm is used in this meaning. The ancient Greeks are called by the Muslim authors *Yūnān* 'Ionians'. It is, however, curious that the Persian Ostanes is called a Greek.

20. *i.e.*, the writings of the Greek Alchemists are not to be accepted in their literal sense, but yield truth only when interpreted by the initiated. See, *e.g.*, the different names of the Philosophers' Stone, in a passage ascribed to Ostanès and translated by Berthelot, *La Chimie au Moyen Âge*, iii, 116.

§ 6.

21. Here we meet for the first time an historical personage amongst the Alchemists mentioned in the *Fihrist*, viz. : ZOSIMOS of Panopolis ('Ikhmīm) in Egypt, who probably flourished in the beginning of the fourth century. What has come down to us of his extensive writings in the original Greek has been published by Berthelot, *Collection des anciens alchimistes grecs*, pp. 107–252; other portions of his works are extant in a Syriac translation, a part of which was translated into French by Duval and published in Berthelot, *La Chimie au Moyen Âge*, (ii, 203–66). His chief work, consisting of many books, was addressed to a lady named THEOSEBEIA; the last book of this work is extant in Greek, whilst part of the first twelve books has been preserved in Syriac. In these documents many titles of books written by, or attributed to, ZOSIMOS are mentioned (see the index to Berthelot, *Collection des anciens alchimistes grecs*, p. 462 *seq.*), but it seems that the titles given by AN-NADĪM here (*The Keys* and *The Seventy Treatises*) and in § 9, no. 18 (*The Elements*) and no. 31 (*To all the scholars*) do not occur elsewhere. In the last the author's name is quite correct, viz. : ZŪSIMŪS; in § 7, no. 24, we have ZŪSIM, but elsewhere it is badly disfigured into RĪSAMŪS, RĪMAS, etc. Arabic translations of Alchemical treatises by ZOSIMOS exist in the Royal Library, Cairo, and in India (Rampur and Asafiyah Libraries, Hyderabad). For an analysis of that at Rampur, cf. Stapleton and Azo in *Memoirs of the Asiatic Society of Bengal*, 1910, iii, 65–8.

22. *i.e.*, in order to preserve the secrets of the Art among the initiated only, he uses metaphors and figures of speech in his writings.

23. This reminds us of similar titles of books written by JĀBIR IBN ḤAYYĀN; see § 12.

§ 7.

24. A similar list, pretending to be an excerpt from *The Paradise of Wisdom* (*Firdaus al-ḥikma*) ascribed to KHĀLID IBN YAZĪD (see § 8), was discovered by Meyerhof in a manuscript of the National Library at Cairo and published by Ruska in *Der Islam*, xviii, 293–99. A list in Greek, containing 27 names of Alchemists, was published by Berthelot, *Collection des anciens alchimistes grecs*, p. 27. The Alchemists mentioned in the *Three Arabic Treatises on Alchemy* by IBN UMAIL (tenth century A.D.) are enumerated in the index of names which is appended to Stapleton and Ḥusain's paper (*Memoirs of the Asiatic Society of Bengal*, 1933, xii, 207–13).

25. The following Section consists of some remarks appended to each of the names in the list on p. 92.

(1) See § 2.

(2) In the view of Muslim writers, AGATHODAIMON is of course a man, not a god. AN-NADĪM (p. 318, 20) states, on the authority of AL-KINDĪ, that he was one of the famous men of the Šābians.

(3) Unidentified. With the reading of S, ANṬŪS, we may compare the title of a Byzantine novel, mentioned in the *Fihrist*, p. 306, 'the Book of ANṬŪS the Pilgrim, and the King of Rūm'. K has *f* (or *q*) instead of *n*. AṬṬŪS occurs in the 'Book of Krates', edited by Berthelot, *La Chimie au Moyen Âge*, iii, 18, 5, where we are told that KRATES during his dream entered *mihrāb Aṭṭūs*, which words are rendered in Houdas' French translation (p. 61) as 'le sanctuaire de PHTA'.

(4) APOLLONIOS, the great thaumaturge of Tyana, does not occur among the authorities mentioned in the Greek Alchemical texts published by Berthelot; but he does appear under the name of ABALĪNŪS in Ruska's list (ii, 66). In the section on Fables, Talismans, and *Niranjāt* (Magic), AN-NADĪM tells us that BALĪNĀS was said to be the first who wrote on Talismans. Two tracts on talismans ascribed to him are still extant, see Plessner, *Beiträge*, in *Islamica*, iv, 551.

(5) PLATO's name heads Berthelot's list, (*Collection des anciens alchimistes grecs*, p. 25, 6) but is not mentioned in Ruska's list.

(6) On ZOSIMOS, see § 6. He also appears below in no. 24 (under the name of ZŪSAM).

(7) Unidentified.

(8) DEMOKRITOS is mentioned both in Berthelot's (*ibid.*, p. 25, 8) and in Ruska's list (ii, 33). On his achievements in Alchemy, see the passages collected by Diels, *Die Fragmente der Vorsokratiker*, ii, 130 *seqq.* His Treatises (*rasā'il*) are mentioned in § 9, no. 30, and the *Emendations to Demokritos* by JĀBIR in § 12, no. 200. Fragments of Greek texts, attributed to DEMOKRITOS, have been published by Berthelot, *Collection des anciens alchimistes grecs*, pp. 41-106. There exists also the so-called *Doctrina Democriti* in Syriac, published with a French translation by Duval in the second volume of Berthelot's *La Chimie au Moyen Âge*. Wellmann has shown that this Ps.-Demokritos was Bolos, the Democritean of Mendes (in Egypt). Bolos lived c. 200 B.C. and wrote (among many other treatises) an Alchemical work, *Baphika* (*vide* Festugière, *op. cit.*, 1944, especially pp. 222 *seqq.*).

(9) On OSTANES, see § 5. The name seems out of place, as OṢṢANES was believed to have existed before DEMOKRITOS.

(10) The Emperor HERAKLEIOS was not only a patron of Alchemists but was himself credited with writings on the Art. In § 9, no. 42, a work of his, consisting of fourteen books is mentioned. Ibn Umail (p. 19, 19, ed. Stapleton) calls him *Hiraqlis malik ar-Rūm* and quotes a saying of his.

He appears both in Berthelot's (p. 25, 13, 'Ἡράκλειος ὁ βασιλεύς) and in Ruska's lists (ii, 53).

(11) With the slight modification of one letter only, BŪRŪS can be altered into TADRŪS, *i.e.*, THEODORE, a name occurring in the form of TADRUS in Ruska's list (ii, 17). Amongst the writings of Zosimos there is one, *πρὸς Θεόδωρον*, see Berthelot, *Collection des anciens alchimistes grecs*, p. 215. There was also a King THEODORE whose discussions with the Alchemist ARAS are referred to several times by Ibn Umail (see the index of Stapleton and Ḥusain's paper, p. 213).

Neither of these two, of course, is himself an Alchemist, and so Meyerhof suggests to read BŪLŪS instead of BŪRŪS. This emendation would be acceptable if this name had been taken from a source written in Pehlevi; there *l* is used instead of *r*. But there is no reason for such an assumption, and besides, Bolos is no Alchemist either.

(12) *i.e.*, MARY THE JEWESS, an authority on Alchemy, already quoted by ZOSIMOS. She is mentioned in the lists of Berthelot (*Collection des anciens Alchimistes grecs*, p. 25, 13), and of Ruska (iii, 1).

(13) Unidentified.

(14) Neither Abraxas (as suggested by Altheim) nor Gregorius—written Gharghūras in Ruska's list (ii, 10)—seems likely.

(15) STEPHANOS ALEXANDRINOS was an Alchemist at the court of the Emperor Herakleios. Of his writings, nine discourses on Alchemy were edited by Ideler (*Physici et Medici Graeci minores*, ii, 199 *seqq.*); and a translation of the first three of these has been published by F. Sherwood Taylor (*Ambix*, 1937, i, 116–39; *idem*, 1938, ii, 38–49).

(16) It is difficult to guess who this ALEXANDER may be. A 'Book of ALEXANDER on the Philosophers' Stone' is mentioned in § 9, no. 3. An ISKANDARĪS appears in Ruska's list (ii, 8).

(17) CHYMES (Chimes, Chemes) is the eponymous hero of Alchemy. In no. 25 the same name is given in the form of SHĪMĀS sh, as transcription of the Greek χ , representing the pronunciation of this letter which was prevalent in Egypt.

(18) JĀMĀSP is, besides OSTANES and ZOROASTER, the only Persian name in this list. His book on the Art is mentioned in § 9, no. 45. He was a prime minister in the reign of HYSTASPES and married a daughter of ZOROASTER. AN-NADĪM (p. 293, 15) knew that he was contemporary with ZOROASTER. Later on JĀMĀSP became a legendary figure. The 'Book of JĀMĀSP' (*Jāmāsp-nāma*) contains questions asked by King VISHTĀSP (Hystaspes) and the answers given by JĀMĀSP, revealing to the king the secrets of the creation and the destiny of the world, and prophesying the conquest of Persia by the Arabs and the fate of its religion (see E. Benveniste, *Revue de l'histoire des religions*, 1932, cvi, 337–80). Ibn Ṣā'id, *Les catégories des nations*, p. 16, knows

of an (Arabic) 'Book of JĀMĀSP' dealing with Astrology. AD-DAMĪRĪ, in his *Zoological Dictionary*, quotes JĀMĀSP several times as an authority on the interpretation of Dreams.

(19) By the slight change of one letter only, the reading RRĀSTŪS of S can be altered into ZURĀSTARIS which is a fairly exact transliteration of *Ζωροάστρης*, under which name the Persian ZARATHUSTRA is quoted by ZOSIMOS; see Berthelot, *Collection des Alchimistes grecs*, p. 229. On this quotation see Bidez et Cumont, *Les Mages hellénisés*, i, 151, and ii, 243.

(20) This ARCHELAOS, a teacher of SOCRATES, was supposed to have written a poem on Alchemy, which was published by Günther Goldschmidt in 1923 (*Herodianī carmina quattuor* — Religionsgeschichtliche Versuche und Vorarbeiten, xix, no. 2). This editor considered that the real author of the poem was HELIODOROS, a contemporary of the Emperor THEODOSIOS III (r. 716–17).

(21) MARQŪNAS is the name of a legendary king of Egypt, see e.g., Maqrīzī, i, 35, ed. Būlāq. He also occurs in Ruska's list (ii, 51). He is the alleged author of treatises (*rasā'il*), in (some of) which he is represented as answering questions asked by SAFANJĀ (see the next note, no. 22). Quotations from these treatises are given by IBN UMAIL; see p. 211 of the index to Stapleton's edition. In an extract from the Paris manuscript, *Supplément arabe*, no. 1074, given by Berthelot, *La Chimie au Moyen Âge*, iii, 17, he is called 'MARQŪSH, king of Egypt, son of THABT, King of Abyssinia', whilst his partner is called 'SAFANJĀ, King of Upper Egypt (*aṣ-Ṣa'id*)'. Elsewhere, it is he who is asking, whilst the instruction is given either by his mother (see IBN UMAIL: p. 32, 11) or by MĪTHĀWUS, 'the Chief of the Distillers' (*ibid.*, p. 53, 17; 61, 23). On MĪTHĀWUS, see note no. 27.

(22) In S, all consonants of SINAQHĀ are distinctly marked and even the first vowel is indicated. In K, the same consonantal skeleton is given but without any dots. Ruska (ii, 56) has SANAQJĀ. In the index to IBN UMAIL's *Three Treatises*, ed. Stapleton, we are given the choice between SANQAJĀ and SAFANJĀ; on the story of this legendary person, see the foregoing note, no. 21.

(23) i.e., CHYMES, see no. 17.

(24) i.e., ZOSIMOS, see § 6.

(25) Both MSS. have FŪRŪS (or QŪRŪS); this is perhaps only a variant of no. 11. If so, we should read TADRŪS, i.e., Theodorus.

(26) Books of PYTHAGORAS on Alchemy are mentioned in § 9, nos. 16 and (perhaps) 43.

(27) The pronunciation of this name is uncertain, as neither S nor K add any diacritical dots. Perhaps it may be a perversion of the name of 'the Chief of the Distillers', MĪTHĀWUS, whose conversation with

King MARQŪNAS (see no. 21) is referred to by IBN UMAIL, pp. 61, 23 and 53, 17. Ibn Umail, p. 53, 20, quotes his '“Great Treatise” (ar-risāla al-‘uẓmā) ’.

(28) MARIANUS or MORIENUS, a Syrian monk, is the alleged teacher of KHĀLID IBN YAZĪD (see § 8); he is also mentioned in a verse of Ibn Umail's (p. 54, 13, Stapleton).

(29) The pronunciation of this name is uncertain as neither S nor K gives any dots. This Alchemist is apparently identical with ISFANDAS in Ruska's list (ii, 61) and with the ASFĪDŪS (ASFĪDIYŪS, ASFĪDRŪS), of the same list.

(30) This author is mentioned in Ruska's list (ii, 11), in Ibn Umail's Treatise (p. 87, 10) and elsewhere. According to AL-QIFṬĪ (p. 13, 11), and IBN ABĪ UṢAIBI 'A (i, 21 pu.), he was a pupil of ASKLEPIOS, but he was untrustworthy, as he stated in one of his books that he had met Solomon. For a ninth-century A.D. Alchemist of this name, see Stapleton and Ḥusain, *op. cit.*, pp. 125 and 142.

(31) Unidentified. It is hardly permissible to think of PARMENIDES.

(32) Meyerhof suggested that the original reading was THĀMISTĪYŪS but I doubt whether THEMISTIUS was ever mentioned as an Alchemist.

(33) Unidentified. On the meaning of *kāhin*, see *Encyclopædia of Islam*, s.v.

(34) The epithet *qass* shows that ARAS was a Christian priest. IBN UMAIL mentions him repeatedly; from his quotations (especially p. 71, 14, Stapleton) we learn that there existed an Alchemical work, composed in the Byzantine epoch, which contained Alchemical instructions in the form of a dialogue between ARAS, the Sage, and THEODORUS (*Thiyyūdaras*), the *Qaiṣar*, King of Byzantium (*Malik ar-Rūm*). Other quotations, apparently from the same dialogue, occur in the *Book of Ḥabīb*, published by Berthelot, *La Chimie au Moyen Âge*, iii. To these references Ruska, *Der Islam*, 1929, xviii, 296, adds the quotations from the *Kitāb al-ilm al-muktasab*, edited by E. J. Holmyard, Trans. pp. 35-7, 42-4, and 46-51.

(35) See next § 8.

(36) *i.e.*, STEPHANOS the Elder (*al-qadīm*). According to the *Fihrist*, p. 244, 2, it was he who translated for KHĀLID IBN YAZĪD books on Alchemy and other subjects. A *Book of Stephanos* is mentioned in § 9, no. 6, but it is doubtful whether it refers to the same Alchemist.

(37) ḤARBĪ is, according to the legend, the teacher of JĀBIR IBN ḤAYYĀN. Regarding his life, a marginal gloss in the Leyden MS., printed in Flügel's edition of the *Fihrist*, ii, 190, gives the following details: He hailed from the Yemen and studied the sciences of the Greeks. Then he went to JA'FAR AṢ-ṢĀDIQ, the sixth Shī'ite Imām (died in 142/765), and became his companion. JĀBIR IBN ḤAYYĀN

studied philosophy under him. He died at the age of 170 (!) years. In a biographical note of a similar character, which E. J. Holmyard, *Science Progress*, 1925, xix, 415 *seq.*, has taken from AL-JILDAKĪ's *Kitāb al-Burhān* (an Alchemical work of the 8/14th century), ḤARBĪ is even said to have lived for 400 years. Amongst the writings of JĀBIR there is a Book of *Emendations of Ḥarbī*, see § 12, no. 201.

(38) See § 11.

(39) He is the well-known statesman, who, after seventeen years of absolute power, by order of the Caliph HĀRŪN AR-RASHĪD in 187/803, was cast into prison where he died three years later. Besides being interested in Alchemy, he is stated earlier in the *Fihrist* (p. 345, 25) to have brought Indian doctors to Irāq, and employed one of them, named MANKAH, to prepare an edition of the chief Indian treatise on Medicine, the *Susruta*.

(40) He is AL-KHĀṬĪF, to whom JĀBIR IBN ḤAYYĀN addressed one of his writings, see § 12, no. 94. Otherwise he is quite unknown.

(41) In § 12, no. 95, a Book of JĀBIR IBN ḤAYYĀN addressed to JUMHŪR AL-QARĪḤĪ (?) is mentioned; and, though this name does not occur elsewhere, I have corrected the reading of S accordingly.

(42) See § 13.

(43), (44) and (45) unknown.

(46) See § 17.

(47) and (48) unknown.

(49) See § 14.

(50) See § 19.

(51) See § 15.

(52) See § 23.

25a. On the meaning of 'external operations', see JĀBIR, *Hudūd*, p. 107, 6, 12, 14; *Ustuquss al-'uss* i, 65 *seq.*; *Nūr*, p. 46; *Ustuquss al-'uss* iii, 101, 102; *Ar-Rahma aṣ-ṣaghīr*, pp. 150, 152.

26. See the enumeration of authors dealing with technological problems, which follows in §§ 20–4.

§ 8.

27. On KHĀLID, the son of the second Umayyad Caliph YAZĪD, and grandson of MU'ĀWIYA, the founder of this dynasty, see the monograph of J. Ruska, *Arabische Alchemisten*, i, Heidelberg, 1924, where also a translation of this Section is given. Ruska tries to show that KHĀLID had nothing to do with Alchemy, and that in fact the Alchemical treatises (both in Arabic and Latin) as well as the verses, bearing his name, are wrongly ascribed to him. Yet there remains the possibility that he actually busied himself with Alchemy (*vide* the treatises and poems ascribed to KHĀLID that exist in Indian Libraries—Stapleton, *Isis*, 1936, xxvi, 129–31).

28. In another passage of the *Fihrist* (p. 244, 2, Flügel), we are told that it was STEPHANUS the Elder (see § 7, no. 36) who translated books on the Art and on other subjects for KHĀLID. There is no reason to suppose that this STEPHANUS was the same person as STEPHANUS the astrologer of HERAKLEIOS (see § 7, no. 15).

29. Some such verses are quoted by IBN UMAIL. A *Diwān* is extant in the Stamboul MS., Köprülü, i, 924; for another collection in Lāleli, 1613, see Plessner, *Islamica*, iv, 529 and 553.

30. The translation is based on the supposition that *hirza*, 'amulet', can form a plural in *-āt*, though it is not recorded in the dictionaries. The reading suggested by S would be *kharazāt*, 'glass beads'; but this does not look like a title.

§ 9.

31. This list contains books which are apparently all attributed to pre-Islamic authors. Its proper place, therefore, should be before Section 8. With regard to the single titles, the following remarks may be made:

(1) DIOSKUROΣ, the priest in the Serapeion at Alexandria, is mentioned in the list of Alchemists in Berthelot's *Collection des anciens alchimistes grecs*, p. 25. He also is found taking part in a dialogue on Alchemy ascribed to SYNESIOS and published by Berthelot, *l.c.*, pp. 56 (see *infra* (5)).

(2) MARY, the Egyptian, is mentioned again in the last Section, § 25. She is a namesake of MĀRIYA, the Coptic slave girl, whom the ruler of Egypt sent to MUḤĀMMAD. She is a different person from MARY the Jewess, mentioned above in § 7, no. 12.

(3) See § 7, no. 16.

(4) A book of the same title was composed by AL-IKHMĪMĪ; see § 16, no. 1.

(5) BADBASIYŪS in Ruska's list (ii, 17) means also SYNESIOS and not, as Ruska thinks, OREIBASIOS.

(6) See § 7, no. 36.

(7) *The Book of KRATES the Sage* has been edited with a French translation by Berthelot, *La Chimie au Moyen Âge*, iii, 1-33 (text) and 44-75 (transl.) On p. 7, 17, we find the same expression *Qrāṭas as-samāwī*.

(8) The use of the article makes it improbable that here SAMŪS is meant who, according to AN-NADĪM (p. 315, 10), was the author of a book on Farriery.

(9) See § 7, no. 12.

(10) Perhaps *Nasṭūr* (? Nestorius).

(11) *Nawādir*, 'rare (things)', perhaps means here 'apophthegms'.

(12) The same name occurs in Ruska's list (ii, 17). An Alchemist EUGENIOS is mentioned by Berthelot, *Collection des anciens alchimistes grecs*, p. 39.

(13) Thamūd is the name of one of the ancient Arabic tribes, the Thamudeni of the classics. The legend of their extinction is often referred to in the *Qur'ān*.

(14) KLEOPATRA, wife of King PTOLEMAIOS, is mentioned in Berthelot's list of Alchemists, p. 25 ; and also in Ruska's list (iii, 4).

(15) Unidentified. The same name appears below (no. 34).

(16) See § 7, no. 26.

(17) BILQĪS is the Arabic name of the Queen of Saba ; see the article about her in the *Encyclopædia of Islam*. Her name appears also in Ruska's list (iii, 7).

(18) See § 6.

(19) SERGIOS OF RESH'AINĀ (Theodosiopolis), who died in A.D. 536, was famous for his translations of Greek works into Syriac. Quotations from the Alchemical treatise ascribed to him occur in AR-RĀZĪ's *Shawāhid* (cf. Stapleton and Azo, *Memoirs of the Asiatic Society of Bengal*, 1910, iii, 71). *Quwairī*, the addressee of this book, is otherwise unknown ; he cannot, for chronological reasons, be identical with QUWAIŘĪ ABŪ ISHĀQ IBRĀHĪM, a translator, mentioned by AN-NADĪM on p. 262, 23.

(20) Stapleton, in the index to IBN UMAIL, p. 208, sees in the first name a misrendering of SAFĪDAS, see § 7, no. 29, and supposes that the second name may mean the Roman Emperor HADRIAN. Cf. also *Ambix*, 1949, iii, 80, n. 11.

(21) and (22) See note on § 7, no. 34.

(23) Unidentified. The emendation ANDRIYĀ is based on the assumption that it could mean Andreas. ANDRIYĀ occurs also in Ruska's list (ii, 55). A quotation from an Alchemical treatise of ANDRIYĀ is found in the *Shawāhid* (cf. *Memoirs of the Asiatic Society of Bengal*, iii, 72). He is also referred to by AL-KĀTHĪ in his *'Ain uş-şan'a* (*ibid.*, i, 52).

(24) MARĪNĀ, *i.e.*, the Greek MARINOS with an Aramaic ending, is recorded in the fourth century A.D. in Hira as the name of an Arabic clan (see, *e.g.*, ABŪ L-FARAJ AL-ISFAHĀNĪ, *Kitāb al-aghānī*, Cairo 1928, ii, 106).

(25) See § 7, no. 11.

(26) Extracts from the writings of CHRISTIANUS PHILOSOPHUS were published in Berthelot's *Collection des anciens alchimistes grecs*, 395–421.

(27) In the *Book of KRATES* (Berthelot, *La Chimie au Moyen Âge*, iii, 61), the narrator when standing in a niche (*miḥrāb*) receives some revelations from an idol (*şanam*).

(28) Unidentified. Flügel thinks, without sufficient reason, of ANDREAS.

(30) See § 7, no. 8.

(31) See § 7, no. 6.

(32) This name can hardly mean GERMANUS, for *g* would be represented in Arabic either by *j* or by *gh*. Instead of 'Metropolitan', S has 'Patriarch' (*baṭrak*) of Rome.

(33) See note on no. 19.

(34) See no. 15.

(35) This treatise on the Art is published in Berthelot's *Collection des anciens alchimistes grecs*, pp. 253–61.

(36) THEOPHILOS, son of THEOGENES, is mentioned by ZOSIMOS (see Berthelot, *Collection des anciens Alchimistes grecs*, pp. 90 and 240).

(37) and (38) *A Book of Three Words* is mentioned amongst the writings ascribed to KHĀLID IBN YAZĪD, see J. Ruska, *Arabische Alchemisten* i, 49. *A Book of Thirty Words* occurs in § 12, no. 115, among the writings of JĀBIR.

(39) See (?) no. 3.

(40) and (41) Unidentified.

(42) On HERAKLEIOS, see § 7, no. 10. This Book is mentioned under the title *Κεφάλαια περὶ τῆς τοῦ χρυσοῦ ποιήσεως ια'* in the list of contents in the codex Marcianus 299, but the text itself is now missing in the manuscript; *ια'* is probably a scribal error instead of *ιδ'*.

(43) See § 7, no. 29.

(44) See note on no. 19.

(45) See § 7, no. 18. A copy still exists in the Rampur Library (*cf.* Stapleton and Azo, *Memoirs of the Asiatic Society of Bengal*, iii, 59), and in the title it is stated to have been written for ARDASHĪR, the first Sasanian king, who began his reign in A.D. 226.

§ 10.

32. Sections 10–12 deal with JĀBIR IBN ḤAYYĀN, the central figure in the history of Arabic Alchemy, who was known to mediæval Christendom by the name of GEBER. Section 10 shows that already in the time of AN-NADĪM opinions about this man differed widely. He was claimed by the Shī'ites, by the Philosophers, and by the Alchemists. His teacher JA'FAR was identified either with the sixth Imām of the Shī'a, JA'FAR AṢ-ṢĀDIQ, or with the Barmacide JA'FAR IBN YAḤYĀ. Some said that he was always wandering about, others maintained that he lived in Kūfa. Here in Kūfa, an Alchemical laboratory was discovered between 356/967 and 367/977, where JĀBIR was supposed to have found the Elixir. But there were others among the scholars and booksellers who either maintained that only the *Book of Mercy* was written by JĀBIR or even went so far as to deny his whole existence. This scepticism,

however, is not shared by AN-NADĪM who considers it impossible that the author of a great work could bring himself to ascribe it to another person.

During the last twenty-five years the JĀBIR problem has been discussed by E. J. Holmyard in the *Proceedings of the Royal Society of Medicine*, 1933, xvi, 46–57, in *Science Progress*, 1925, xix, 415–26, and in *Studien zur Geschichte der Chemie, Festgabe für E. O. von Lippmann*, 1927, 28–37. Aided by Stapleton, Holmyard showed that JĀBIR's father, ḤAYYĀN, was in all probability a druggist, who served the Shi'ites as a missionary and was, therefore, killed by order of the Umayyad Government in A.D. 721. This being so, it was quite natural that the son of a man who had sacrificed his life for the sake of the Shi'ites was helped by the Imām JA'FAR. Holmyard, therefore, thinks that JĀBIR was educated and instructed by JA'FAR AṢ-ṢĀDIQ, and that the tradition concerning the relationship between these two men is reliable. On the other hand, J. Ruska, 'The History and Present Status of the Jābir Problem', *Journal of Chemical Education*, 1929, vi, 1266–76, argued that the existence of a JĀBIR IBN ḤAYYĀN who was a contemporary of JA'FAR AṢ-ṢĀDIQ, did not prove that the writings ascribed to him are genuine. Ruska's doubts as to the authorship of most of the JĀBIR *Corpus* were soon substantiated by Paul Kraus, 'Dschābir ibn Ḥajjān und die Ismā'īliya', *Dritter Jahresbericht des Forschungs-Instituts für Geschichte der Naturwissenschaften in Berlin*, 1930, 23–42. Kraus analysed not only the works of the so-called JĀBIR, which were published by O. Houdas and by Holmyard, but also some other writings, which he published in 1935 (see the references given in the note on Section 12). By means of an investigation into the contents as well as the language and, especially, the terminology, Kraus proved conclusively that these books—at least in their present form—could not have been written by an author of the eighth century, but were probably composed about the year A.D. 900 by an anonymous author (or authors), who belonged to the Ismā'īliya and dealt not only with Alchemy and Medicine, but inserted also the tenets of this sect, especially their doctrine of the Imām.

Sections 10 and 11 were in part translated by Ruska, *l.c.*

33. 'Gate' (*bāb*) in the terminology of the Ismā'īliya denotes a spiritual guide, by whose instructions the novices were initiated into the secrets of the creed, see *Encyclopædia of Islam*, s.v.

34. It is not clear whether he was persecuted on account of his subversive activities or as an Alchemist. The same phrase is used by AN-NADĪM with reference to AS-SĀ'IH AL-'ALAWĪ (*vide* § 19 *infra*).

35. Some of his writings are addressed to the Barmacides (see note on § 12, no. 1). JA'FAR's father, YAḤYĀ IBN KḤĀLID, is mentioned in the list of Alchemists (*vide* § 7, no. 39).

36. *Rīṭl* is a loan-word from the Greek *λίτρα*, 'pound'; see *Encyclopædia of Islam*, s.v. *Raṭl*.

37. JĀBIR's *K. ar-raḥma* is printed in Berthelot's *La Chimie au Moyen Âge*, iii, 132–60. It is quoted in the *K. al-khawāṣṣ al-kabīr*, p. 314, Kraus. In

the *K. an-nūr*, p. 45, 10, JĀBIR asserts that his first work was the *K. ar-raḥma*. Another tract, called *K. ar-raḥma aṣ-ṣaghīr*, has been published twice, by Berthelot, *l.c.*, on pp. 99–104 and by Holmyard pp. 147–57. Commentaries on it are mentioned in § 17, no. 1 and § 23, no. 3.

38. Such books do not occur in § 12.

39. This is perhaps a mistake on the part of the author ; for our text does not contain any such references.

40. This can of course mean that his father came from Khorasan, whilst he himself was either born or lived in Kūfa.

41. *e.g.*, in the *K. al-Asrār* ; see Stapleton, Azo, and Ḥusain, 'Chemistry in Iraq and Persia in the Tenth Century A.D.'—*Memoirs of the Asiatic Society of Bengal*, viii, 335.

§ 11.

42. Of the persons mentioned in this Section, the first is otherwise unknown, whilst the name of the second occurs in § 21, end. The third is dealt with in § 16.

§ 12.

43. This Section is taken from JĀBIR's own Catalogues of which AN-NADĪM knew two, viz. : a large and a small one. A *Third Catalogue* is mentioned in Jābir's smaller *Book of the Balance* (*K. al-mīzān*, Kraus, p. 451), whilst in his *Book of the Glorious* (*K. al-Mājid*, Kraus, p. 115) *The Catalogue* is referred to without any specification. Here we have the first example in Arabic literature of an author giving a catalogue of his works, in imitation of Greek models, *e.g.*, CHRYSIPPOS, (see Diogenes Laertius, vii, 198), or GALEN. In the writings of JĀBIR—as in the *Treatises of the Ikhwān aṣ-ṣafā'*—much stress is laid on the proper sequence of the books and chapters. Once and again the reader is told in what order he should proceed so that he may derive the fullest profit from his studies. From the order of books in S I have followed the order in K is slightly different, viz. : 1–22, 24, 23, 25–32, 36–8, 41, 40, 42, 46, 45, 44, 47, 46, 49, 48, 50, 55–69, 73–4, 76–8, 81, 80, 83–116, 118, 117, 119–39, 142–223, 225, 224, 226–8, 230 *seqq.* The numbering given in S and K shows that 14 titles are missing, viz. : 8 from the *CXII Books*, 5 from the *LXX Books* and 1 from the *XVII Books*. These titles do not refer to separate books, but to Sections—sometimes of a few pages only—of larger units, so that from a literary point of view the *CXII Books*, the *LXX Books*, etc. represent the actual works. This accounts also for the otherwise inexplicable fact that some titles occur repeatedly ; for it simply means that the same topic was discussed in different connections.

Of the writings of JĀBIR only a few have been published. Some were edited with a French translation by O. Houdas in Berthelot, *La Chimie au Moyen Âge*, iii, 91–205 (text) and 126–224 (translation). Already in 1891 eleven tracts

had been published in lithograph at Bombay, and a reprint of this Bombay edition was made in 1928 by E. J. Holmyard, *The Arabic Works of Jābir ibn Ḥayyān* (Paris, 1928, vol. I., part I). Finally Paul Kraus, in volume I of his *Jābir ibn Ḥayyān; Essai sur l'histoire des idées scientifiques dans l'Islam*, Paris, 1935, edited a selection illustrating the different aspects of this author's doctrines. In the following notes on the single titles, these texts are referred to by the name of the editor. The list of JĀBIR's works, compiled by Holmyard in the *Proceedings of the Royal Society of Medicine*, 1923, xvi, 48 seq., is referred to as 'Holmyard' (with their respective number).

I. The following notes refer by number to *The CXII Books*, nos. 1–112. This work is mentioned in the *Seventy*, e.g., p. 471 and 475, Kraus, and elsewhere in the extracts published by Kraus, see pp. 144, 196, 300, 354.

(1), (2), and (3) *Ustuquss* goes back, through the intermediary of Aramaic, to the Greek στοιχεῖον. That the *Ustuquss al-uss* is the opening book of the *CXII Books* is also borne out by the *K. maidān al-'aql* (*infra* no. 297, Kraus, p. 214). It consists, however, of three parts dealing with opinions of the Philosophers, the Theologians, and the Alchemists respectively; all three were published by Holmyard, pp. 59–112, together with a Commentary (*tafsir k. al-ustuquss*) on pp. 113–24. This Commentary is called on p. 124 *The Book of Perfection* (al-kamāl). The *Ustuquss al-uss* is also mentioned in the *K. at-Taḡmī'* (p. 376) and its Commentary (*sharḥ*) in the *K. al-aḥjār* (Kraus, p. 197). The title *al-Ustuquss* appears again in no. 43. The work was dedicated to the Barmacides; as also were nos. 98, 101, and 102 (to individual members of this family).

(4) and (5) Extant in the Paris MS. arabe 2606.

(6) A similar title in § 13, no. 1.

(7) Edited by Holmyard, pp. 3–12. On this tract, see P. Kraus, 'Dschābir ibn Ḥajjān und die Ismā'īlija' *Dritter Jahresbericht des Forschungs-Instituts für Geschichte der Naturwissenschaften in Berlin*, 1930, 36–8.

(9) Edited by Holmyard, pp. 43–7.

(10) Quoted in the *Book of the Stone*, p. 38, 1, Holmyard. The plural *al-aṣbāgh* occurs in no. 72.

(11) and (12) A book known as *al-khamā'ir* (*The Ferments*) is mentioned in the third *Book of the Element of Foundation*, p. 104, 13, Holmyard. In *LXX*, 37, a *K. al-khamā'ir wa l-malāghim* is quoted (Plessner). The title *K. al-khamā'ir* occurs again in § 17, no. 2. See also *K. at-takhmīr* in § 21, no. 5.

(13) See note on no. 46.

(16) Mentioned in *LXX*, 37 (Plessner). This work is different from the two books of *Eastern Mercury* and *Western Mercury* published by Berthelot, *Le Chimie au Moyen Âge*, pp. 180–93.

(17) and (18) On *Barrānī*, *lit.* 'External', and its opposite, *Jawwānī*, *lit.* 'Internal', see *K. Uṣṭuquṣ al-uss* (p. 65 and p. 101 *seqq.*, Holmyard) and the *K. al-ḥudūd* (p. 107, Kraus). See also § 7, end ; and §§ 20–4.

(20) Quoted in *LXX*, 2 (Plessner).

(21) Quoted in *LXX*, 15 (Plessner).

(22) The same title occurs in no. 53. *Baiḍ* is a cryptic name of the Stone, see *K. al-ḥajar* (p. 38, 5, Holmyard).

(23) This title too means the Stone, see *K. al-ḥajar* (p. 38, 9, Holmyard).

(24) Extant in the Brit. Mus. MS. Add. 7722, 5.

(25) The same title occurs in no. 56, and in a quotation in the *K. al-aḥjār* (p. 154, Kraus).

(28) Extant in the Paris MS. arabe 2606.

(29) The same title occurs in no. 55 ; the singular in no. 77.

(30) The same title occurs in no. 57. Both books are different from the four *Books of Stones according to the opinion of APOLLONIOS* (*al-aḥjār 'alā ra'y Balīnās*), published by Kraus, *l.c.*, pp. 126–206, and quoted in the *K. al-khawāṣṣ*, p. 329, and in the *K. at-taṣrīf*, p. 404 and p. 416. On p. 154, there is a reference to another *K. al-aḥjār*.

(31) Quoted in the *LXX* (p. 316, Kraus. Abū Qalamūn, from *ὑποκάλαμον*, means not only the *pinna*, or 'sea-wing', and its so-called wool, but also other shiny objects, as, *e.g.*, iridescent cloth or shot-silk, then opal, and, finally, the Chameleon. See *Enc. of Islam* s.v.

(34) *takrīr* means the repetition of the process by which the substance of the metal is refined. Metaphorically, the term can be applied to metempsychosis.

(35) Extant in MS. Brit. Mus. Add. 7722, 11.

(36) I follow the reading of K, whilst S has *al-budūḥ* (without dots). *Ontadarruj*, see, *e.g.*, the *K. al-mājid* (p. 117 *seq.*, Kraus), where the necessity for graduated progress is illustrated by the simile of a man who, after a long imprisonment in a dark dungeon, must gradually accustom his eyes to the light. *Budūḥ* is the name of the Magic Square, formed of the numbers 1 to 9 in such a way that the total in each row in any direction is always 15 ; see *Encyclopædia of Islam*, s.v.

(39) and (40) 'Moon' can mean Silver, and 'Sun', Gold.

(41) The same title appears in no. 62. Both books are different from the *K. at-tarākīb*, extant in the Paris MS. Arabe 2606, and quoted in the '*K. maidān a-l'aql* (p. 221, Kraus).

(43) See a similar title in nos. 1 to 3.

(44) 'Animal' can mean Mercury ; see the *K. az-zībaq ash-sharqī* (p. 181, 1, Berthelot). The same title occurs in no. 54.

(45) 'Urine' can mean the Elixir ; see *K. al-ḥajar*, p. 38, 11, Holmyard.

(46) See no. 13. This book is referred to, along with the *K. at-tadābir aṣ-ṣaghīr* and a third book of the same title, in the *K. al-khawāṣṣ al-kabīr*

(p. 322, Kraus). The same title occurs among the *LXX Books*, see no. 174. A *K. at-tadbīr* is further quoted in the *K. uṣṭuquṣṣ al-uss*, p. 105, 1, Holmyard. Cf. also the *K. ar-rāhib*, p. 529, Kraus. According to the *Book of Definitions* (p. 106, Kraus), *tadbīr* means the processes by which some accidents were changed into other accidents of a higher order—thus leading more easily to the Perfect Elixir. The singular *at-tadbīr* was the title of one of the *CXII Books*, see the *K. at-tajmī'* (p. 346, Kraus).

(47) Quoted in *LXX*, 1, 2 (Plessner).

(48) This title is doubtful: as S and K have no dots, it is possible to read with Flügel, *kimān*, 'heaps'.

(49) *Books on the Qualities* are mentioned in the *K. al-ḥajar* (p. 36, 10, Holmyard). The problem of Quality is discussed in the *K. ikhrāj mā fī l-quwwa ilā l-fi'l* (pp. 66–9, Kraus).

(51) This is different from the *K. ard al-ḥajar*, published by Berthelot. *l.c.*, pp. 201–5.

(52) See Holmyard's list, no. 35. This book is, according to JĀBIR's statement in his *K. al-khawāṣṣ al-kabīr*, p. 324, Kraus, a digest of the *CXII Books*; see also p. 327, Kraus. It is further mentioned in the *K. at-tajrīd*, p. 217, Holmyard.

(53) See no. 22. (54) See no. 44. (55) See no. 29.

(56) See no. 25. (57) See no. 30. (60) See note on no. 11.

(62) Extant in the Paris MS. 2606, and quoted in *LXX*, p. 475, Kraus.

(63) It is different from the *K. al-khawāṣṣ al-kabīr* which comprises 71 books—see the extracts, pp. 224–332, Kraus, especially p. 231, 1. To this larger work the quotation in the *K. al-baḥṭh* may refer (p. 527, Kraus). Finally a *K. al-khawāṣṣ al-khamsīn* is mentioned in the *K. az-zībag al-gharbī* (p. 192, 14, Berthelot, *l.c.*).

(64) Extant, see Holmyard's list, no. 22.

(70) Quoted in the *K. maidān al-'aql* (p. 211, Kraus); a *K. al-burhān wa-ithbāt aṣ-ṣan'a* is mentioned in *LXX*, 1, 47, 56, 67 (Plessner).

(72) See no. 10.

(75) The same title occurs in the *LXX*; *infra* no. 116. *Manī* can mean 'the Stone'; see *K. al-ḥajar*, p. 38, Holmyard.

(76) In the *LXX* (p. 471, Kraus), it is said that among the *CXII* there is a *K. al-atyān*, *Book of Clays*. It is also quoted in the *K. at-tajmī'* (p. 344, Kraus).

(77) See no. 29.

(78) A *K. al-ḥajar* has been edited by Holmyard, p. 12–24.

(79) Quoted in the *LXX*, 30 (Plessner).

(81) Mentioned in the *K. ikhrāj mā fī l-quwwa ilā l-fi'l* (p. 31, Kraus).

(84) S has *aṣ-ṣāri'*, 'the Wrestler'.

(85) In case *farqad* (instead of *ifrind*) should be read, a *K. al-farqad* is mentioned in the *K. as-sirr al-maknūn* (p. 338, Kraus). On Farqad, the name of a star near the Pole, see *Encyclopædia of Islam*, s.v.

(87) See Holmyard's list, no. 25. The same title reappears in the *LXX*, *infra* no. 142.

(90) The characters given in K and S without dots admit also the readings *al-ḥibāl*, 'the ropes'; *al-khabāl*, 'ruin'; *al-khayāl*, 'phantom'.

(92) *Zirnikh* means Arsenic Sulphide, including both orpiment and realgar; see Stapleton, Azo, and Husain, 'Chemistry in 'Iraq and Persia in the Tenth Century A.D.' in *Memoirs of the Asiatic Society of Bengal* 1927, viii, 321.

(93) S and K have *ilāhī* (written 'lhy), 'my god', which can hardly stand as a title.

(94) See § 7, no. 40.

(95) See note on § 7, no. 41.

(96) 'ALĪ IBN YAQṬĪN was born in 124/741-2 at Kūfa (*Fihrist*, p. 224). His father YAQṬĪN was a Shī'ite missionary (*dā'i*). Persecuted by the last Umayyad Caliph, Marwān II (r. 127/744-132/749), the family had to flee, and YAQṬĪN's wife with her two boys 'ALĪ and 'UBAID found refuge in Mecca. After the overthrow of the Umayyad dynasty, they went back to Kūfa, and YAQṬĪN and his son 'ALĪ entered the service of the Abbasids; though secretly they still adhered to their Shī'ite convictions. 'Alī died at Bagdad in 182/798, three years before his father; see the article devoted to this family by AN-NADĪM, p. 224, Flügel. Some verses addressed to 'ALĪ IBN YAQṬĪN are mentioned in *LXX*, 2 (Plessner). He was a contemporary of the Vizier YAḤYĀ IBN BARMĀK (c. A.H. 120-90) and died five years before the execution of Yaḥyā's son Ja'far in A.H. 187/A.D. 803. For the latter, see no. 102.

(97) A similar title is found in al-'Irāqī's *K. al-mukṭasab fī zirā'at adh-dhahab*, edited by Holmyard.

(98) This Barmacide is otherwise unknown.

(99) The numerous quotations from the *k. at-taṣrīf* met with in the texts published by Kraus (cf. pp. 92, 127, 128, 130, 133, 136, 137, 176, 193, 196, 329, 332, 342, 343, 346, 360, 384) refer to a book which belongs to the so-called *XXXII Books* (p. 416), extracts of which are found on pp. 392-424, Kraus.

(100) The same title reappears in the *LXX*, below no. 117. K reads *al-Hindī*, 'the Indian (steel)'.

(101) This Barmacide is otherwise unknown.

(102) See § 7, no. 39.

(104) A similar title reappears in nos. 225, 245, 281, and 293. In *LXX*, 1, 46, it is stated that this was the last of the *CXII Books* (Plessner).

II. The following remarks apply to the *LXX Books*, nos. 113-82. See Ruska, 'Die 70 Bücher', etc., in *Studien zur Geschichte der Chemie, Festgabe für E.O. von Lippmann*, Berlin, 1927, 38-47, where a short summary of the contents is

given. Specimens will be found on pp. 460-81 of the edition of Kraus. The *LXX* are quoted, e.g., in the *K. al-ḥajar* (p. 24, 11, and p. 36, 10, Holmyard); in the *K. ar-raḥma aṣ-ṣaghīr* (p. 149, 4, Holmyard) and in the *K. al-tajmī'* (p. 354, Kraus). In the *K. al-khawāṣṣ al-kabīr* (p. 324, 4, Kraus) it is said that the books 40-60 form the most instructive part of the work, whilst in the same book (p. 300, Kraus) we are informed that there existed a Supplement to the *LXX*, called *as-Sab'inīyāt* which comprised ten books. (See below nos. 183-92). The *LXX* are, according to p. 479 Kraus, a commentary on the *CXII*.

(115) It is also called *k. al-īdāḥ* (as no. 185 below). A passage from it was published by Holmyard, *The Present Position of the Jābir Problem*, p. 424. A similar title occurs in § 9, nos. 37-8.

(116) See *supra* no. 75. K gives the vocalization *al-munā*, 'the Desires'.

(119) A book of ZOSIMOS with the same title is quoted in the *K. al-ḥajar* (p. 19, 13, Holmyard).

(130) For extracts, see pp. 460-4, Kraus.

(137) The Latin translator of the 'Seventy' read *Khalās*, i.e., 'Deliverance', as we find the title of the 27th Treatise is *Liber Evasionis*.

(142) Extracts given on pp. 465-70, Kraus. The same title occurs in the *CXII*, above no. 87. A third (?) book with the same title is mentioned in the *K. al-khawāṣṣ al-kabīr* (p. 326, Kraus).

(146) Extracts given on pp. 470-2, Kraus. A book of the same title, apparently belonging to the *XXXII*, is referred to in the *K. al-baḥṭh* (p. 534, Kraus).

(149) A *K. maṣādir al-ḥajar* is extant in the Berlin MS. 4199, 1.

(150) *Al-jam'* is also the special title of the first discourse of the *K. al-khawāṣṣ al-kabīr* (p. 231 and p. 240, Kraus).

(151) and (152) The two titles, *The Book of the Gift* (*al-'aṭā'*) and the *Book of the Plays* (*al-malā'ib*) which should come between nos. 134 and 135 and are missing in K, L, and S, were supplied by Ruska.

(153)-(162) Contrary to AN-NADĪM's assertion, these ten books—the fifth decade of the 'Seventy'—had special titles; see Ruska's article. Extracts from nos. 154, 155, 158, and 159 are given by Kraus (pp. 472-84).

(163)-(172) See the special titles of these ten books in Ruska's article. No. 171 has the title *K. al-ḥudūd* and is different from the book published by Kraus (pp. 97-114). There is also among the *K. al-mawāzīn* a book called *K. al-ḥudūd* (see p. 321, Kraus). References to books of this title are also met with in the *K. al-aḥjār* (pp. 138, 141, 156, 175, 179, 182, 184, 188, and 193), in the *K. maidān al-'aql* (p. 209), and in the *K. at-tajmī'* (p. 379, Kraus).

(172) Extracts from no. 172 are given on pp. 485-8 (Kraus).

(173)-(182) Here again the special titles have been supplied by Ruska.

(174) *K. at-tadābīr*, the same title as no. 46.

(178) Cf. for the same title *al-Mushtarī*, no. 295 (incorporating the opinions of Apollonius).

(179) For a second treatise with the title *al-Mirrīkh*, see no. 287.

III. The Supplement to the *LXX Books*, nos. 183–92.

In the *K. al-khawāṣṣ al-kabīr* (p. 300, Kraus), these books are called 'the Seventies' (*as-Sab'inīyāt*).

(185) See no. 115.

(187) On the importance of the term *Mizān* in the writings of JĀBIR, see P. Kraus, 'Dschābir ibn Ḥajjān, *Dritter Jahresbericht des Forschungsinstituts für Geschichte der Naturwissenschaften in Berlin*, 1930, 25 seq. Extracts from a *K. al-mizān aṣ-ṣaghīr* are given by Kraus, pp. 425–59, whence it would seem that it belongs to the *XXXII Books*. Another book of the title *Al-Mizān* is referred to in the *K. ikhrāj mā fī l-quwwa ilā l-fī'l*, p. 92; in the *K. al-aḥjār*, p. 196; in the *K. maidān al-'aql*, pp. 207, 211, 213; in the *K. al-khawāṣṣ al-kabīr*, pp. 273, 322, 329, 332; in the *K. at-tajmī'*, pp. 342, 343, 369; and in the *K. at-taṣrīf*, pp. 413 and 416. Then there occur references to *The Book(s) of the Balances (Al-Mawāzīn)* in the *K. al-aḥjār*, pp. 126, 156, 197, 200, 206, 209, and in the *K. al-khawāṣṣ al-kabīr*, pp. 273, 293, 324, 330, Kraus. See also *infra* no. 235. A *K. al-Mawāzīn aṣ-ṣaghīr* was edited by Berthelot (pp. 105–31).

(192) The same title occurs again in nos. 225, 245, 281, and 293. For similar title, see no. 104 *supra*.

IV. Nos. (193)–(220) are a collection of Alchemical tracts, called 'Corrections' because each tract contains a number of sayings of a single philosopher, which are each followed by a correction (*tashīḥ*). See also no. 183 and *infra* § 16, no. 3, and § 17, no. 5.

(193) See § 7, no. 26.

(194) Holmyard's list, no. 39.

(195) Extant in the Stamboul MS. Raghīb 965 (see Plessner, 'Beiträge' in *Islamica*, iv, 550), and referred to in the *K. Uṣṭuquṣ al-Uss* (p. 82, 4, Holmyard).

(199) HOMER and his poem are mentioned in the *LXX Books* and elsewhere, e.g., pp. 315, 374, 454, Kraus.

(200) See § 7, no. 8.

(201) See § 7, no. 37.

V. Nos. (203)–(212) In a passage of the *K. al-khawāṣṣ al-kabīr* (p. 325, Kraus) reference is made to the *Twenty Books*, but is it not clear which collection of Jābir's treatises is meant. It has, of course, nothing to do with the *Twenty Propositions (al-jumal al-'ishrūn)* mentioned on p. 325 Kraus.

VI. Nos. (223)–(225).

(223) Extant in the Paris MS, arabe 2606,

(224) The same title occurs in nos. 243 and 280.

(225) See note on no. 104.

VII. The *XVII Books*, nos. (226)–(242).

The *XVII Books* are quoted in the *K. al-khawāṣṣ al-kabīr* (p. 326, Kraus, referred to in the note on nos. 203 *seqq.*).

(229) A similar title occurs in § 13, no. 2.

(231) One of the *LXX* has this title. Cf. also § 14 for *AR-RĀZĪ*'s *K. al-miḥnra*.

(235) See note on no. 187.

(236) This is different from the *K. as-sirr al-maknūn*, the introduction to which is given by Kraus (pp. 333–40), whilst a Commentary on it is mentioned in the *K. al-mizān aṣ-ṣaghīr*, p. 451, Kraus; see also the references to the *K. as-sirr al-maknūn* in the *K. al-khawāṣṣ al-kabīr* (pp. 240 and 318, Kraus).

VIII. Nos. (243)–(245).

(243) See note on no. 224.

(245) See no. 225.

IX. The *XXX Books*, nos. (246)–(275).

Another collection of *XXX Books* is mentioned in the *K. al-khawāṣṣ al-kabīr* (p. 325, Kraus).

X. Nos. (276)–(279).

Apparently these books deal with the Four Elements; there is, however, a reference to a Fifth Element in the *K. at-ṭabīʿa al-khāmisa* mentioned in the *K. al-khawāṣṣ al-kabīr* (p. 318, Kraus).

XI. Nos. (280)–(281).

(280) See no. 224.

(281) See no. 225.

XII. Nos. (282)–(285).

(282) Instead of *az-Zuhara* (see no. 290), we can also read *az-Zuhra*, 'the Flower'. This book was, according to al-Jildakī (*cf.* Holmyard, *The Present Position of the Jābir Problem*), written for the Caliph Hārūn (285) ar-Rashīd. A book of the same title is quoted in the *K. as-sirr al-maknūn* (p. 339, Kraus).

XIII. The *Ten Books in the wise of Apollonios*, nos. 286–95.

On APOLLONIOS of Tyana, see § 7, no. 4. The four *Books of the Stones according to the opinion (ra'y) of Apollonios* were published in part by Kraus (pp. 126–205). The names of the planets probably stand for those of the corresponding metals.

(288) A book with the same title is mentioned among the 15 books dealing with Balances (*mawāzīn*) in the *K. al-mīzān aṣ-ṣaghīr* (p. 450, Kraus). This may be the same as the *K. aṣh-shams* quoted in the *K. al-aḥjār*, p. 138; in the *K. maidān al-'aql*, p. 210; and in the *K. at-taṣrīf*, p. 413, Kraus. *As-Shams* is also the title of one of the *CXII Books*, see note on no. 40.

(290) See also no. 225.

(292) The same title occurs among the 15 books on Balances given in the *K. al-mīzān aṣ-ṣaghīr*, p. 450, Kraus. The *K. aṣh-shams wa l-qamar* occurs on pp. 138, 210, and 413, Kraus. The same title appears also in the *CXII Books* (see no. 39).

(293) See no. 225.

XIV. Nos. (296)–(299).

(296) In the texts published by Kraus, the *Book of the Result* is very often mentioned as one of JĀBIR's most important works; in the *K. al-khawāṣṣ al-kabīr*, p. 240, it is spoken of in the most extravagant fashion: Ja'far aṣ-Ṣādiq, it is said, blamed JĀBIR for composing it and would have liked to have it cancelled; for it reveals the innermost secrets of the Art. In the *K. al-aḥjār* (p. 133), it is placed much higher than the *K. aṣ-ṣafwa*. From the *K. al-aḥjār* (p. 196) and the *K. maidān al-'aql* (pp. 209, 213, 214, and 216), we can gather that it deals with the *Doctrine of Balances* (*'Ilm al-Mawāzīn*) and especially with the numerical values of the letters of those metals which are used in preparing the Elixir. Some extracts from this extraordinary book are given by Kraus (pp. 533–41. See further pp. 92, 130, 131, 137, 151, 157, 164, 165, and 385).

(297) This tract is published by Kraus (pp. 206–23). The title is explained on p. 214. It is quoted on pp. 130, 131, 155, 175, and 416.

(298) Quoted in the *K. ikhrāj mā fī l-quwwa ilā l-fi'l*, p. 58, and in the *K. maidān al-'aql*, p. 209, Kraus.

(299) Quoted in the *K. maidān al-'aql*, p. 221 *seqq.*, Kraus, and in the *K. ar-raḥma aṣ-ṣaghīr*, p. 149, 3, Holmyard. The Leyden MS. adds here that *K. at-tanzīl* (written without dots) which is mentioned in the *K. al-khawāṣṣ al-kabīr* (p. 230 and p. 332, Kraus).

(306) *Jārūf* means literally 'carrying away everything': this may refer either to a torrent or to a greedy person; perhaps it may mean something like a 'sweeping argument'.

44. The expression *ḥiyal* can mean 'automata', as, e.g., in the *K. al-ḥiyal* or *The Book of Ingenious Constructions*, a treatise on Mechanics composed by the Banū Mūsā (see Friedrich Hauser, *Über das Kitāb al-ḥiyal*, etc., Erlangen 1922, 16). *Ḥiyal* can also mean 'tricks'.

45. This title, apparently a proper name, has not yet been identified.

46. A *K. al-ṭibb al-kabīr* is quoted in the *K. ikhrāj mā fī l-quwwa ilā l-fīl*, p. 56, Kraus. See also note on no. 53. To these books belongs also the *Book of Poisons (as-samūm)* studied by Ruska.

47. On *Nīranjāt*, see above § 3, note 17.

48. See the *K. al-khawāṣṣ al-kabīr*, extracts from which are given by Kraus (pp. 224–332). *Fifty Treatises on Specific Properties* are quoted in the *K. ikhrāj*, etc. (p. 75, Kraus).

49. The title of this book can be read either *al-mulk*, 'the Kingdom', or *al-malik*, 'the King'. A book of this title, being the eighth of the 500 *Books*, was edited by Berthelot, pp. 91–8, and is quoted in the *K. ar-raḥma aṣ-ṣaghīr* (p. 149, 4). Another book of the same title was published by Holmyard (pp. 159–72). There is also a reference to a *K. al-mulk* in the *K. al-khawāṣṣ al-kabīr* (p. 326, Kraus).

50. A book of this title is very highly recommended in the *K. al-khawāṣṣ al-kabīr* (p. 326 *seqq.*, Kraus); it consists of twenty parts and deals with the processes of Solution, Fusion, Calcination, Sublimation, Rusting, Ceration, etc.

51. In the texts which were published by Kraus, some other books are quoted, which do not occur in the list of JĀBIR's works as given in the *Fihrist*. Amongst them are some collections called after the number of books they comprise, e.g. :

I. The XXXII Books.

These are quoted in the *K. al-mulk* (p. 170, 3, Holmyard) and among them are :

(1) The *K. aṣ-ṣaḥwa*, see p. 389 Kraus; it is further mentioned on pp. 133, 151, 197, 208, 346, 381, 386, and 450.

(2) The four *Books of Stones (al-aḥjār)* according to the opinion of APOLLONIOS, published in part by Kraus (pp. 126–205).

(3) The *K. at-taṣrīf*, also published in part by Kraus (pp. 392–424; see p. 416).

(4) The *K. at-tajmī'*, published in part by Berthelot (pp. 161–79) and by Kraus (pp. 341–91, see p. 389). It is quoted in the *K. al-mulk*, (p. 167, 1 Holmyard), in the *K. ikhrāj*, etc. (pp. 56, 92, and 94); in the *K. al-aḥjār* (p. 138); in the *K. al-khawāṣṣ al-kabīr* (p. 230); in the *K. as-sirr al-maknūn* (p. 339); in the *K. at-taṣrīf* (pp. 400 and 416); and in the *K. ar-rāhib* (p. 529, Kraus).

(5) The *K. al-ṭibb an-nabawī 'alā ra'y ahl al-bait* (see pp. 451, 416, and 371, Kraus).

II. Extracts from a collection of 'Fifty Books' are given by Kraus (pp. 489–500).

III. In the *K. Uṣṭuquṣ al-Uss* (p. 87, Holmyard) 'The 140 Books' are mentioned. In the *K. ikhrāj*, etc. (p. 31, Kraus), there is a reference to '143 Books';

and, finally, '144 Books' are quoted in the *K. al-ḥajar* (p. 36, 11, Holmyard) : in the *K. ikhrāj*, etc. (p. 85 Kraus), and in the *K. al-khawāṣṣ*, *al-kabīr* which itself is one of them (pp. 322 and 329, Kraus).

IV. '500 Books' are mentioned in the *K. al-mulk*, which is one of them (p. 149, Holmyard) ; in the *K. az-zībaq al-gharbī* (p. 195, 13, Berthelot) ; and in the *K. al-ḥudūd*, which is also one of them (p. 102, Kraus).

Then there are a number of single books which are quoted, *e.g.* :

- (1) *aḥwāl al-kawākib* (p. 414, Kraus).
- (2) *al-adilla* (pp. 220, 337, and 339, Kraus).
- (3) *al-istidlāl* (p. 220, Kraus).
- (4) *al-ishtimāl* (p. 510 ; an extract from it is printed on pp. 548–55, Kraus).
- (5) *al-ashkāl at-ṭabīʿiya* (p. 346, Kraus).
- (6) *al-uṣūl* (pp. 74, 322, 338, 342, 442, and 450, Kraus).
- (7) *al-afāḍil* (pp. 138 and 209, Kraus).
- (8) *al-imāma* (pp. 22, 3 and 89, 7, Holmyard, and pp. 236, 528, and 543, Kraus).
- (9) *al-bāh wa-tawallud al-janīn* (p. 32, 7, Holmyard).
- (10) *al-bughya* (i.e., *bughyat ar-riyāḍa fī taʿālīm uṣūl al-mawāzīn*)—(pp. 210, 211, 314, and 450, Kraus).
- (11) *at-taqdīr* or *at-taqrīr* (pp. 238, 239, and 332, Kraus).
- (12) *al-ḥaraka wa l-mutaḥarrik* (p. 515, Kraus).
- (13) *ad-dār* (p. 317, Kraus).
- (14) *al-ʿilm al-makhzūn* (pp. 318, 319, 321, 325, 328, 332, Kraus).
- (15) *al-muttaḥid* (p. 326, Kraus).
- (16) *al-makhārīq* (p. 197, Kraus).
- (17) *al-marāṣid* (p. 329, Kraus).
- (18) *al-mizāj* (pp. 243, 263, 318, 339, and, 340, Kraus).
- (19) *al-maʿrifa* (p. 326, Kraus).
- (20) *manāqib amīr al-muʿminīn al-ʿazīz* (p. 36, Kraus).
- (21) *al-muntahā* (pp. 210, 211, 213, and 451, Kraus).

§ 13.

52. DHŪ N-NŪN, already mentioned in § 7, no. 42, is one of the earliest mystics in Islam. He was of Nubian stock, born in Ikḥmīm and settled at Old Cairo. His ideas about Gnosis, *i.e.*, a knowledge revealed in ecstasy, which he imparted to his disciples, brought him into conflict with the authorities ; he was sent to the court of the Caliph AL-MUTAWAKKIL at Bagdad, but was acquitted and returned to Old Cairo. He died in 245/860. It is as yet an open question whether he busied himself with Alchemy. The three verses ascribed to him (see Ruska, *Arabische Alchemisten*, ii, 90 and 56) are spurious. A disproof of imputations against him—possibly regarding the Alchemical

writings ascribed to DHŪ N-NŪN—was written by his fellow townsman AL-IKHMĪMĪ (see § 16, no. 4). DHŪ N-NŪN's two books have nearly the same titles as nos. 6 and 229 in the list of JĀBIR's works.

§ 14.

53. On AR-RĀZĪ, or RHASES, as he was called in mediæval Europe, see Stapleton, Azo, and Ḥusain, 'Chemistry in 'Irāq and Persia in the Tenth Century A.D.' in *Memoirs of the Asiatic Society of Bengal*, viii, no. 6. See also *Encyclopædia of Islam*, s.v. *ar-Rāzī*, and Max Meyerhof in *The Legacy of Islam* Oxford, 1931 (pp. 323 *seqq.*). Born in 251/866 at Raiy, the ancient Rhagae (near the modern capital of Persia, Teheran), AR-RĀZĪ studied at Bagdad, practised medicine, was appointed to the hospital of his native place, and became, later, Superintendent of the Great Hospital of Bagdad. Many rulers invited him to their courts and consulted him. He died in 313/925, at Raiy. He was the greatest physician the Muslim world has ever seen. He compiled the *Continens (al-Hāwī)*, a vast Encyclopædia on Medicine, which, like many other works of his pen, was translated into Latin. His treatise *On Smallpox and Measles* brought him no less fame. He left altogether more than one hundred writings on Medicine. He also wrote on many other subjects: Mathematics, Astronomy, Optics, Meteorology, etc. From a review in *Orientalia*, N.S., xii, 174 *seqq.*, I learn that the first volume of AR-RĀZĪ'S *Opera philosophica fragmentaque quae supersunt*, collegit et edidit Paul Kraus, has appeared at Cairo. Ar-Rāzī's Alchemical writings have been studied, especially in the *Memoirs* previously mentioned. Stapleton has shown that AR-RĀZĪ was one of the most remarkable men of science. He rejected mysticism and occultism, and admitted nothing that could not be proved by experiment and test to be a real fact. His *Introduction* and his *Book of Secrets* are collections of scientifically arranged facts. His classification of the substances is exact, his description of Chemical Processes and Apparatus is lucid. Even, if further researches should prove that AR-RĀZĪ was greatly indebted to his teacher JĀBIR B. ḤAYYĀN, yet credit is due to him for having stated in scientific language a huge amount of actual facts. The list of AR-RĀZĪ's books on Alchemy has been discussed by H. E. Stapleton, *l.c.*, pp. 336 *seqq.*, and by J. Ruska, 'Die Alchemie Ar-Rāzīs' in *Der Islam*, 1935, xxii, 281 *seqq.* Here the following remarks on those mentioned by AN-NADĪM may be made:

(1) The text of the *Madkhal* was published by H. E. Stapleton, *l.c.*, pp. 412-17, with a translation on pp. 345-61.

(2) The next treatise is also called *K. 'ilal al-ma'ādīn*, 'The Book of the Causes (leading to the formation) of the Minerals'.

(3) Here AR-RĀZĪ discusses the question of the truth of Alchemy and defends it against its opponents. This treatise is utilized by AL-MAJRĪTĪ in the *Rutbat al-ḥakīm* (see Ruska, p. 291).

(4), (5) and (6) These books too are mentioned in the *Rutbat al-hakim* (Ruska, *l.c.*, p. 291, who quotes, from the sixth book, AR-RĀZĪ's definition of the Elixir).

(8) It is also called *K. ar-rāḥa*, 'The Book of Ease'.

(9) This is better known as *K. ash-Shawāhid*, 'The Book of Evidences'. It is a collection of apophthegms of the ancient philosophers on the Art, together with AR-RĀZĪ's explanations. What may be a commentary on it, by AL-KHANSHALĪL, is mentioned in § 21, no. 1.

(11) AL-BĪRŪNĪ (Leyden MS. Or. 889; see Ruska, *l.c.*, p. 284) gives as title *miḥan adh-dhahab wa l-fiḍḍa*, 'The Tests of Gold and Silver'.

(12) It is also called *Sirr al-ḥukanā' waḥīyaluhum*, 'The Secret and Devices of the Sages'.

(13) and (14) Probably both these works are extant. Two introductory sections of the *K. al-Asrār* have been translated by H. E. Stapleton (*l.c.*, pp. 369-87). A summary of third part is given by Ruska (*l.c.*, pp. 293-9).

(19) AL-KINDĪ, the famous 'Philosopher of the Arabs' (died c. A.D. 875), wrote a treatise *On the Futility of the Claim of those who pretend the making of Gold and Silver and on their Deceits* (*risāla fī buṭlān da'wā l-mudda'in ṣan'at adh-dhahab wa l-fiḍḍa wa-khad'ihim* (*Fihrist*, p. 261, 16, Flügel)); *al-Qiṭṭī* (p. 316, 6) gives the title as *K. fī ibṭāl da'wā man yadda'ī ṣan'at adh-dhahab wa l-fiḍḍa*. In the two discourses (*maqāla*) of this work he argued that man cannot perform what nature alone can do, and that the practices of the Alchemists are deceitful and fraudulent. In his refutation, AR-RĀZĪ tried to convince the reader that AL-KINDĪ's premises were wrong, and that the making of gold and silver sometimes does happen (see al-Mas'ūdī, *Les prairies d'or*, viii, 117).

In the *Ghāyat al-hakim*, a handbook of practical Magic attributed to MASLAMA AL-MAJRĪTĪ, but actually written about the middle of the fifth/eleventh century, we find a long quotation from AR-RĀZĪ's treatise on the making of Talismans (*risāla fī ṣan'at aṭ-ṭilsamāt*). If this treatise be genuine, then this great physician not only believed in the Alchemical Art, but also in the efficacy of Talismans, though here again he insisted on the necessity of bringing out the facts by experiment and test.

§ 15.

54. IBN WAḤSHĪYA is the author of the famous *Nabatean Agriculture*, a book dealing not only with plants and their cultivation, but also with much astrological and magical matter that was alleged to represent the wisdom of early mankind. According to the preface, it was first composed in 291/903 and then re-edited in 318/930. A summary of its contents has been given by M. Plessner, 'Der Inhalt der nabatäischen Landwirtschaft', in *Zeitschrift für Semiotistik*, vi, 22-56. On the Stamboul manuscripts, see the same in *Islamica*, vi,

554-6). The author of the *Ghāyat al-ḥakīm* has largely drawn upon the *Nabatean Agriculture* (e.g. pp. 63, 179, 230 *seqq.*, 309, 350 *seqq.*, 356 *seqq.*, and 360-95).

55. These two places were situated between Kūfa and Wāsiṭ.

56. By the term 'Nabateans' the Muslim writers understood the peasants of the rural districts outside Arabia (in contradistinction to the Nomads) and, especially, the Aramaic-speaking population of 'Irāq.

57. See p. 311 *seqq.*, Flügel.

58. See note on § 12, no. 36.

59. These alphabets were cryptographs, destined to make texts written therein unintelligible to the uninitiated. Sometimes foreign alphabets were used for this purpose, but generally the persons in question devised alphabets of their own. A collection of 80 alphabets is extant in the *k. shauq al-mustahām fī ma'rifat rumūz al-aqlām*, which was erroneously attributed to IBN WAḤSHĪYA by J. von Hammer, who published it together with an English translation in 1806 under the title '*Ancient Alphabets and Hieroglyphic Characters*, explained in the Arabic Language by Ahmad Bin Abū bekr Bin Wahshih; and in English by Joseph Hammer'. I know this edition only by the review written by S. de Sacy in the *Magazin Encyclopédique*, 1810, 145 *seqq.*

60. ABŪ L-ḤASAN IBN AL-KŪFĪ, i.e., 'ALĪ IBN MUḤAMMAD, was born at Kūfa in A.H. 254/A.D. 868 and died in Bagdad in A.H. 348/A.D. 960. See AL-KHAṬĪB, *Bagdad Chronicle*, xii, 81. He was a famous calligrapher. Manuscripts written by him were in great demand, both for their beauty as well as for their correctness. AN-NADĪM had a liking for his penmanship, and refers quite often to books written by him.

61. The BANŪ L-FURĀT were a well-known family to which belonged many high state-officials of the Abbāsid Caliphate, e.g., the ill-famed vizier ABŪ L-ḤASAN 'ALĪ IBN AL-FURĀT (who was executed in 312/924), his brother JA'FAR, his sons AL-FADL and AL-MUḤASSIN, his nephew AL-FADL, and others. A vivid picture of the troublesome times in which ABŪ L-ḤASAN 'ALĪ was thrice in office, is given by H. Bowen, *The Life and Times of 'Alī Ibn 'Isā, the Good Vizier* (Cambridge, 1928).

62. Perhaps ABŪ L-ḤASAN 'ALĪ IBN AL-FATH AL-MUṬAWWAQ is meant. This writer continued IBN AL-JARRĀḤ's *Kitāb al-Wuzarā'* and brought the history of the vizierate down to the time of AL-KALWĀDHĀNĪ, who was vizier of the Caliph al-Muqtadir in 319/931.

63. ABŪ L-'ANBAS AṢ-ṢAIMARĪ (died A.H. 248/A.D. 862-3), the witty and frivolous boon companion of the Caliph AL-MUTAWAKKIL. He was the author of a number of facetious works which AN-NADĪM enumerates in his article on ABŪ L-'ANBAS (*Fihrist*, p. 151 *seqq.*).

64. This word, clearly written in K, has not been identified as yet. In K, the letters of the Arabic alphabet are given, but the corresponding characters

of the *Fāqīṭūs*-alphabet are omitted. IBN KHALDŪN, (*Prolégomènes*, iii, 183, Quatremère) has *Al-Qāfīṭūs*.

65. *Musnad* is, with Muslim writers generally, the name of the Himyaritic alphabet, and is used by AN-NADĪM in this sense on p. 5 of Flügel's edition where the characters of this alphabet are given. Here, however, it seems to denote the Hieroglyphs of ancient Egypt.

66. *'Anbath* is unidentified.

67. The meaning of this section seems to be that these cryptographs are applied in two different ways : either they contain a text in a foreign language (e.g., Himyaritic inscriptions, or Egyptian texts in Hieroglyphs) or they conceal a text in the Arabic language. In the latter case, it is only necessary to replace every character by the corresponding letter of the Arabic alphabet.

§ 16.

68. His relations with IBN WAḤSHĪYA fix his time at the beginning of the fourth/tenth century ; but unless JĀBIR IBN ḤAYYĀN actually lived in the latter half of the ninth century A.D., this AL-IKHMĪMĪ can hardly have been the pupil of JĀBIR mentioned in § 11. With regard to his books, the following remarks may be made :

- (1) The same title occurs in § 9, no. 4.
- (3) The same title occurs in § 17, no. 5 ; compare also the *K. at-taṣṣīḥ* in § 12, no. 183.
- (4) See § 13.

§ 17.

69. The name of ABŪ QIRĀN occurred previously in the list of Alchemists given in § 7, no. 46. The fact that he was quoted by IBN WAḤSHĪYA shows that he must have lived about the year 300/912. As for his books, the following may be added :

- (1) On JĀBIR's *K. ar-raḥma*, see note 37.
- (2) Two books on Ferments occur amongst the works of JĀBIR (see § 12, nos. 11 and 12).
- (4) As this title is left in K without dots, its exact form remains doubtful.
- (5) See note on § 16, no. 3.
- (6) See § 12, no. 22.
- (7) The translation 'Sevenfold' is conjectural, as the word is left in K without dots.

§ 18.

70. STEPHANUS of Mosul is otherwise unknown ; he was probably an older contemporary of AN-NADĪM. The titles of his writings show that he followed the magical and astrological practices adopted by the Græco-Egyptian Alchemists. As regards certain of the titles, I add the following :

(2) K has *k. mā ḥaddathnāhu*, 'What we related'; my translation is based on the slight emendation '*mā aḥdathnāhu*'.

(3) By the 'Greatest Gate', the Elixir is meant. For JĀBIR's *K. al-bāb*, see § 12, no. 114.

71. '*umr*', 'monastery' is a loan-word from the Syriac '*umrā*' 'habitation, monastery'. In Arabic, it is sometimes used instead of its synonym, *dair*; see, e.g., Yāqūt, *Geographical Dictionary*, iii, 724-6, Wüstenfeld.

§ 19.

72. For a previous mention, see § 7, no. 50. His surname AS-SĀ'IH, the 'wanderer, or pilgrim', implies that he led the life of an itinerant devotee. He is called *al-'Alawī*, 'the Alide', because he was a descendant of AL-ḤASAN IBN 'ALĪ IBN ABĪ ṬĀLIB, the grandson of MUḤAMMAD. It seems that he lived about the middle of the fourth/tenth century. In the titles of his books, he shows a marked leaning towards the use of cryptic names:

(3) *ḥāqīr*

and *nāfi'* are cryptic names by which Iron is meant; see J. Ruska und E. Wiedemann, 'Alchemistische Decknamen', in *Sitzungsberichte der Physikalisch-medizinischen Sozietät zu Erlangen*, lvi, 23.

(6) See § 10, nos. 22-4.

§ 20.

73. AL-KINDĪ died c. A.D. 875, so DUBAIS must have lived in the latter half of the ninth century. AL-KINDĪ was an opponent of the Alchemists, as we have seen in § 14, no. 19; it is, therefore, not very probable that his pupil DUBAIS should have believed in the possibility of making gold; apparently he busied himself with what is called 'External Practices', see note on § 12, no. 18, e.g., the making of dyes and inks, as indicated by the second title of his books. The title of the other work, viz.: *al-jāmi'*, gives no hint as to its contents, but simply means that in it the relevant subject matter is collected. See also § 21, no. 2.

74. DUBAIS is a diminutive of *dibs*, 'treacle'. For another Alchemist of the same name, DUBAIS IBN MALIK AL-ANṬĀKĪ who may have lived a century after this DUBAIS, see Stapleton and Azo, in *Memoirs of the Asiatic Society of Bengal*, 1910, iii, 78-9.

§ 21.

75. The titles of his books show that their contents were of a technical nature.

(1) For 'External Practices', see note on § 12, no. 18.

(2) The same title as in § 20, no. 1.

76. See § 11, no. 2,

§ 22.

77. This translation is doubtful; *talwīḥ* can mean 'the heating of a thing with fire', see Lane *s.v.*, who also registers the part. pass. *mulawwāḥ*, 'altered by fire'. So *talwīḥāt* and *talāwīḥ* may mean 'processes of heating'. Dozy on the other hand renders *lwḥ* II by '*faire briller, orner*', and though in the example quoted by him ('I embellished my book with his name') this verb is used metaphorically, the original meaning may be 'to make a thing shining', and this, I think, suits the context better than 'heating'. Perhaps the making of enamels and various kinds of glasses is intended.

78. This seems to refer to the making of Artificial Pearls.

§ 23.

79. Contrary to his assertion, AN-NADĪM gives in the Section on *Shī'a* writers (p. 196, 19, Flügel) only the scantiest information about this author, viz.: his name *ABŪ JA'FAR MUḤAMMAD IBN 'ALĪ*, and the title of his *Book of Guidance (al-hidāya)*. He also mentions him in the biographies of his follower IBN ABĪ 'AUN (pp. 147, 21), and of ABŪ SAHL AN-NAUBAKHTĪ (p. 176, 25); and again in the list of Alchemists (§ 7, no. 52). IBN ABĪ L-'AZĀQIR came from Shalmaghān, a village in the neighbourhood of Wāsiṭ, and went to Bagdad where he obtained a Secretaryship. He was a partisan of the BANŪ L-FURĀT (see note on § 15, no. 61), who were, like him, Shī'ites. Originally he belonged to that branch of the *Shī'a* which is called *Imāmiya* or Twelvers, but in the excited times which preceded the ultimate disintegration of the Abbāsid empire, he came forward with very advanced ideas and found some adherents amongst the high officials of the capital; it is said that even the Vizier 'AMĪD AD-DAULA sympathized with him. The activities of his adherents brought him into conflict with the government. In the reign of AR-RĀDĪ (322/934) he was arrested, put on trial by order of the Vizier IBN MUQLA, found guilty, and executed. Of his adherents 'AMĪD AD-DAULA recanted and by doing so saved his life; whilst IBN ABĪ 'AUN refused to recant, and was executed with his master. A fairly detailed report of his trial and the reasons for his execution is given by YĀQŪT (*Dictionary of Learned Men*, i, 296-307, in the biography of IBN ABĪ 'AUN). YĀQŪT's main source of information is an official letter written by the Caliph AR-RĀDĪ to the ruler of Khurāsān, NAṢR (II), AS-SĀMĀNĪ. From this we learn that IBN ABĪ L-'AZĀQIR claimed to be a manifestation of the Divine Being, and was recognized by his followers as such. He taught that God manifests himself in everything though in varying degrees, and that the opposite of a thing is nearer to this thing than something which resembles it. From this he developed his doctrine of Contrasts (corresponding to the Syzygies of the Pseudo-Clementines; see Friedlaender, 'The Heterodoxies of the Shī'ites', *Journal of the American Oriental Society*, xxix, 116). According to this doctrine,

God revealed himself successively in ADAM, ENOCH, NOAH, ṢĀLIḤ (the Prophet of the Thamūd, mentioned in the *Qur'ān*), but God was also found in a Satan, who was associated with each of them. Then God revealed himself in ABRAHAM and NIMROD, in AARON and PHARAOH, in DAVID and GOLIATH, and then again in SOLOMON, JESUS, 'ALĪ and their corresponding Satans till he finally appeared in IBN ABĪ L-'AZĀQIR and *his* Satan. IBN ABĪ L-'AZĀQIR regarded MOSES and MUḤAMMAD as impostors, who had usurped the dignity which actually belonged to AARON and 'ALĪ respectively; he further declared that 'ALĪ would show forbearance to MUḤAMMAD for 350 years (*i.e.*, 5×70) and that at the end of this period the (Muslim) law would be abolished. In order to get over the difficulties arising out of a literal understanding of the *Qur'ān*, he apparently made use of allegorical interpretations; *e.g.*, he declared that by Paradise was meant the knowledge and profession of his doctrine, whilst ignorance of it, or deviation from it, was Hell. By a play of words he derived *malak*, 'angel' (originally *mal'ak*, 'messenger'), from *malak nafsahū*, 'he was self-possessing'. It was also said that he believed in metempsychosis. Then the prosecution apparently made much of his alleged licentiousness: for it was rumoured that he thought no spiritual intercourse possible without carnal union, and that his followers held their wives in common. The real motive, however, was probably political, as it seems he forecast the destruction of the Abbāsīd power.

That IBN ABĪ L-'AZĀQIR busied himself with Alchemy is also stated by YĀQŪT (*l.c.*, i, 296 *seqq.*). As for the titles of his works, the following remarks may be made:

- (1) The same title occurs in § 12, no. 11, and in § 17, no. 2.
- (3) See § 17, no. 1.
- (4) On 'External Operations', see § 12, no. 18.

§ 24.

80. Al-Khanshalīl means 'stout and strong'.

- (1) This is possibly a Commentary on one of AR-RĀZĪ's books, see § 14, no. 10.
- (2) and (3) See § 12, nos. 39, 40.

§ 25.

81. The meaning seems to be this: the books on Alchemy are too numerous to be enumerated here, especially as the later authors plagiarized the works of their predecessors.

82. See § 3, note 14.
83. See § 7, no. 12.

84. By 'the first Persians', AN-NADĪM, like other Muslim writers, means the earliest inhabitants of Persia down to the beginning of the Parthian era. The erroneous idea that Alchemy had its origin in Persia, was probably advanced by some *Shu'ūbi* writers, who—as 'Partisans of the Gentiles'—tried to prove the superiority of their people over the Arabs. In all probability, the study of Alchemy reached Persia only in Hellenistic times.

85. It was at the time of AN-NADĪM that the Muslims became better acquainted with the cultures of both India and China, which, by their antiquity and obvious importance, made a deep impression on them. This may account for the assertion that Alchemy had had its origin in either of these two countries

MUSIC IN THE TREATISES OF GREEK GNOSTICS AND ALCHEMISTS.

By EGON WELLESZ.

THE treatises on musical theory written by Byzantine authors were largely based on the works of classical and Hellenistic philosophers and theorists¹. In the opening sections in which the writers dealt with music in general terms, and even in those in which the different modes and scales were described, hardly anything can be found which has any connection with the music actually practised in the Eastern Empire. These treatises were, in fact, not written for the use of the musician but for the students of the 'stepping-stones of wisdom' (*σοφίας ἐπιβάθραι*)²: grammar, rhetoric, dialectic, medicine, arithmetic and geometry. For them, the term music had a threefold significance; it could mean either the music of the spheres, or the harmonious concord by which the parts of the soul correspond to the elements of the body, or, lastly, the music which is perceptible to our ears. These three kinds of music are governed by the same numerical ratios, the ratios by which the cosmos is harmoniously ordered. Boethius (d. 524-6), who sums up classical musical theory, therefore speaks of three *musicæ genera*: (1) *musica mundana*, (2) *musica humana*, (3) *musica quæ in quibusdam constituta est instrumentis*³.

Byzantine philosophers and theorists deal mainly with the first two kinds of music, *musica mundana* and *musica humana*. They follow the lines laid down by Neo-Platonic philosophers whose theories on music derive in the main from Plato's ideas in the *Timæus* about the World Soul⁴ and the soul as the 'attunement' of the body⁵.

In the course of my work for my book on the history of Byzantine music my attention was drawn to two groups of documents by Greek writers which are also concerned with music, viz. the works of Gnostic authors on magic, and those of the Byzantine Alchemists⁶. Investigations into these two groups

¹ Cf. E. Wellesz, *A History of Byzantine music and hymnography*, Oxford, 1949, pp. 38-55.

² Cf. Nichomachus Gerasenus, *Theologoumena arithmetica* (Ast.), p. 17.

³ Cf. Boethius, *de institutione musica*, I, ii, ed. G. Friedlein, Leipzig, 1867, pp. 187-9.

⁴ *Timæus* 34A-47B. Cf. F. M. Cornford, *Plato's Cosmology*, London, 1937, pp. 57-159.

⁵ A. E. Taylor, *A Commentary on Plato's Timæus*, Oxford, 1928, p. 18.

⁶ Cf. É. Ruelle, 'Le Chant des sept voyelles grecques d'après Démétrius et les papyrus de Leyde', *R.É.G.* ii (1888), 38 sqq.; 'Le Chant gnostico-magique des sept voyelles grecques', *Congrès d'histoire de la musique* (Paris, 1900), 15 sqq.; É. Poirée, 'Formules musicales des papyrus magiques', *ibid.*, 28 sqq.; A. Gastoué, 'Les Origines du chant romain', *Bibl. musical.* i (1907), 24-31; H. Leclercq, 'Alphabet vocalique des Gnostiques', *D.A.C.L.* i. 1268 sqq.; M. Berthelot-É. Ruelle, *Collection des anciens Alchimistes grecs* (1887-8), ii. 219, 434; K. Wachsmann, *Untersuchungen zum vorgregorianischen Gesang* (1935), 24-34; G. Reese, *Music in the Middle Ages* (1940), 85-6.

of sources have been going on for a considerable time ; but only recently have attempts been made to connect certain magic formulae which are found in fragments of Greek papyri, and in speculations on music in passages of alchemical treatises, with the origins of Byzantine musical theory ⁷. It therefore remains to be seen whether the hypothesis, put forward with a great deal of ingenuity, can be accepted.

By the kind permission of the Delegates of the Clarendon Press the pages of my book which deal with this subject are reprinted here ⁸. Some additions have been made to the text in order to explain some matters more fully, and also in order to include a short discussion of passages on music in the first part of the alchemical treatise *de magna et sacra arte* by Stephanos of Alexandria, published by F. Sherwood Taylor in *Ambix* i (1937), with an English translation and a commentary.

(a) *Gnostic formulae of incantation.*

In a number of Greek papyri containing fragments of treatises on magic, incantations have been found beginning or ending with groups of letters consisting of the seven Greek vowels $\alpha \epsilon \eta \iota \omicron \upsilon \omega$ in various combinations, e.g. :

ὁ τῶν ὅλων δεσπότης
 ἄγιε κάνθαρε: αὖ σαθρεναβρασάξ: ιαωαιαεω·
 ηωα: ωαη: ιαω: ιηο εὐ: αη: εὐ: ιαωαι ⁹.

Similar combinations are also to be found on small pieces of papyrus, serving as amulets ¹⁰ :

α α α α
 ο ο ο ο ο
 η η η η
 ι ι ι ι ι
 ο ο ο ο ο ο ο
 υ υ υ υ
 ω ω

The meaning of these groups of vowels becomes evident from formulae of invocation in the papyrus W of Leyden ¹¹, of which two significant examples may be given :

⁷ C. Höeg, 'La Théorie de la musique byzantine', *R.É.G.* xxxv (1922), 321-34.

⁸ pp. 56-66.

⁹ C. Wessely, 'Neue griechische Zauberpapyri', *Denkschriften d. K. Ak. d. Wiss. i. Wien phil.-hist. Cl.* xlii (1893), 27.

¹⁰ *Ibid.*, 72.

¹¹ C. Leemans, *Papyri graeci musci antiquarii publici Lugduni-Batavi*, Tom. ii (Leyden, 1885).

- (1) Σοῦ τὸ ζ̄ γραμμάτων ὄνομα πρὸς τὴν ἁρμονίαν
τῶν ζ̄ φθόγγων ἐχόντων φωνὰς πρὸς τὰ κ̄η φῶτα
σελήνης, Σαραφαρα, Αραφαιρα, Βρααρμαραφα,
Αβρααχ, Περταωμηχ, Ακμηχ, Ιαω: ουεη: ιαω:
ουε: ειου: αηω: εηου: Ιαω. (p. 17, ll. 28–31.)

(Thy name, composed of seven letters, according to the harmony of the seven tones, which have their sound according to the twenty-eight lights of the Moon, Saraphara, Araphaira, Braarmarapha, Abraach, Pertaomech, Akmech, Ιαω: oueē: ιαω: oue: eiou: aēō: ēōu: ēōu: Ιαō.)

- (2) Ἐπικαλοῦμαί σε, Κύριε, ὠδικῶ ὕμνω, ὕμνῳ σου
τὸ ἅγιον κράτος, αεῖωωωω.
Ἐπίθνε λέγων·
ηιουω, ιουω, ουω, υω, ω, αεε, ηηη, ιιι,
οοοοο, υυυυυ, ωωωααω, ωηωααω,
οοοοο, ιιιιιω, ιιιιιωαεαωο.

(I invoke thee, Lord, in a hymnic song, I celebrate thy holy might, αεēιοōδō.

Sacrifice after, saying :

ēiouō, iouō, ouō, uō, ō, aee, ēēē, iiii,
οοοοο, υυυυυ, ὀδδδδδδδ, ὀēδαδαδ,
οοοοο, ιιιιιω, ιιιιιωαεαωο. (p. 14, ll. 31–6.)

From Oriental mystery rites it is known that single vowels or groups of vowels were uttered by the initiate to intensify the effect of the incantation. The texts of the two invocations from papyrus W, however, seem to permit of another interpretation by which stress is laid on the words ὠδικῶ ὕμνω and ὕμνῳ σου in the second invocation, on ἁρμονίαν, φθόγγων, and φωνὰς in the first. It is this interpretation which C. É. Ruelle, and following him other scholars¹², adopted in order to prove that the seven Greek vowels were used by the Gnostics in the place of the seven tones of the seven-stringed lyre, tuned on the two conjunct tetrachords of the Dorian scale. According to the Pythagorean doctrine each tone of this scale represented the sound of one of the seven planets; therefore, Ruelle and his followers argued, the seven Greek vowels were magical symbols of the music of the spheres.

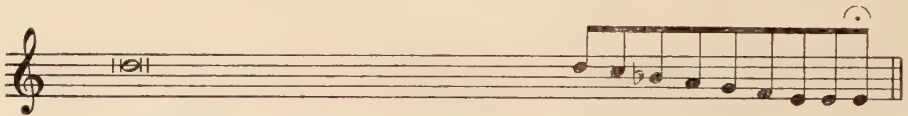
This hypothesis is based on a passage from the treatise *On Style* (περὶ ἐρμηνείας) formerly ascribed to Demetrius Phalereus, which suggests that the Gnostics had adopted the Egyptian magic ritual. 'In Egypt too the priests celebrate (ὕμνοισι) the gods through the seven vowels, letting them sound one after the other; and instead of the aulos and the zither it is the sound of these

¹² Cf. p. 56, n. 1. Ruelle gives in 'Le Chant des sept voyelles' a summary of the theories of his predecessors on the subject.

letters which is heard in euphony ' ¹³. The clue which made it possible to determine the pitch of each of the tones represented by a vowel was found in a passage from the *Harmonics* of Nicomachus of Gerasa ¹⁴. Developing the Pythagorean conception of the relation between the harmony of the world and that regulating the intervals in music, Nicomachus states that the motion of each of the seven spheres produces a sound (*ψόφον ποιόν*); the first sphere producing the first tone, the second sphere the second tone, and so on. To these tones the names of the seven vowels have been given. According to the cosmological doctrine of Anaximander, adopted and elaborated by Pythagoras and a later generation of his followers ¹⁵, the spheres carry the heavenly bodies in their revolutions round the earth. The vowels therefore are also symbols of the planets. Thus the following concordances between vowels, planets, and tones have been established by Gnostic writers, as we can see from the *Harmonics* of Nicomachus ¹⁶:

A	Moon	Nete	d'
E	Venus	Paranete	c'
H	Mercury	Paramese	b ^b
I	Sun	Mese	a
O	Mars	Lichanos	g
Y	Jupiter	Parhypate	f
Ω	Saturn	Hypate	e

Taking *ὑμνεῖν* in the second invocation literally as 'to sing', A. Gastoué, starting from Ruelle's hypothesis, arrives at the following rendering of the vowels into musical notation ¹⁷:



Ἐπικαλοῦμαί σε, Κύριε, ᾠδικῶ ὕμνω· ὕμνῳ σου τὸ ἅγιον κράτος.

¹³ Ἐν Αἰγύπτῳ δ' ἐκαὶ τοὺς θεοὺς ὑμνοῦσι διὰ τῶν ἑπτὰ φωνηέντων οἱ ἱερεῖς, φεξῆς ἤχουντες αὐτά, καὶ ἀντὶ αὐλοῦ, καὶ ἀντὶ κιθάρας, τῶν γραμμάτων τούτων ὁ ἦχος ἀκούεται ὑπ' εὐφωνίας. *Rhetores Graeci*, edited by L. Spengel (1856), iii, 278.

¹⁴ *Mus. Script. Graeci*, ed. C. Jan, p. 276, l. 8–p. 277, l. 9.

¹⁵ J. Burnet, *Early Greek Philosophy* ¹⁶, pp. 306–7.

¹⁶ *Mus. Script. Graeci*, ed. Jan, pp. 241–2, and C. É. Ruelle, 'Le Chant des sept voyelles grecques', *op. cit.*, 20; Irenaeus, *Adv. haereses*, i, 14, P.G. vol. vii, c. 610, quotes Marcus (who flourished in the second century A.D.), a disciple of Valentinus writing in his *Sige*, that 'the first heaven sounds the A, the next the E, the third the H, the fourth, in the middle, cries out the might of the I (τὴν τοῦ I δύναμιν ἐκφωνεῖ), the fifth the O, the sixth the Y, the seventh and fourth from the middle calls out the element of the Ω (τὸ Ω στοιχεῖον ἐκβοᾷ)'.
¹⁷ A. Gastoué, *Les Origines du chant romain*, 29.

From the musical point of view such a final cadence makes a strange impression, but is not impossible. It must be considered, however, whether the formulae of incantation and the vowels were actually meant to be sung by the performer of the sacred rites, or to be pronounced mentally, according to the practice known from mystery sects in the East. From a passage in the *Excerpta* it is obvious that Nicomachus had a kind of mystical utterance in mind, and not real singing, since he says that the initiates invoke the god symbolically by hissings and sibilations, and by inarticulate and incoherent sounds ¹⁸.

We have to bear in mind that to the Greeks the letters of the alphabet were identical with numbers, for which they had no ciphers. Since the Pythagoreans professed that the essence of all things was numbers, they attributed great importance to the correspondence of the seven Ionian vowels to the same number of planets, seeing in the equal number of both a sacred manifestation of the holy figure seven ¹⁹. Thus they came to use the seven vowels for the planets themselves, as well as for the sound of these celestial bodies. Archytas, however, had already pointed out that these were not perceptible to the human senses ²⁰. The same view is found in Plato's *Timaeus*, where there is no suggestion that the music of the heavens might be audible to human ears ²¹. According to Nicomachus it is number 'pre-existent in the mind of the world-creating God, number conceptual only and immaterial in every way, but at the same time the true and eternal essence' by which all things are created: time, motion, the heavens, the stars, and the whole celestial revolution ²². Nicomachus distinguishes this divine number sharply from the other, which can be apprehended (*ἐπιστηματικός*); the latter being constantly found in connection with material things ²³. It is obvious that the vowels were not meant to be symbols of audible tones, but of the divine numbers, through which the immaterial nature of the god was revealed to the priests. In mystery rites the magic ceremonial aimed at transferring the initiate from the material sphere to the immaterial. The invocations formed part of the process of transformation, and silence was thought to be 'the first companion of the divine name' ²⁴.

¹⁸ διὸ δὴ ὅταν μάλιστα οἱ θεουργοὶ τὸ τοιοῦτον σεβάζωνται, σιγμοῖς τε καὶ ποππυσμοῖς καὶ ἀνάνθοις καὶ ἀσυνφώνοις ἤχοις συμβολικῶς ἐπικαλοῦνται. *Excerpta ex Nicomacho, Mus. Script. Graeci*, 277, 6.

¹⁹ F. Dornseiff, 'Das Alphabet in Mystik und Magie', *Στοιχεῖα*, vii (1922), 33.

²⁰ H. Diels, *Die Fragm. d. Vorsokr.* i ²⁴, 330.

²¹ F. M. Cornford, 'Plato's Cosmology', *The Timaeus of Plato*, 72.

²² D'Ooge, *Nicom. Introduction to Arithmetic* I, vi, 189-90.

²³ *Ibid.*, 98.

²⁴ ὁ ἄ σύντροφος τοῦ ὀνόματος σιγή. K. Preisendanz, *Papyri Graecae Magicae*, ii (1931), 34. C. Wessely's transcription of this passage from Pap. I. London 121 in *Neue griech. Zauberpapyri*, 47-48, is incorrect. The transcription and interpretation of the passage in A. Gastoué's *Les Origines du chant romain*, 30, can, therefore, no longer be regarded as valid.

From these theoretical considerations we must now turn back to the transcriptions of the groups of vowels into musical notation ²⁵. An examination of the melodic structure of the examples taken from papyrus W of the museum at Leyden and the Berlin papyrus shows that some of them were intended for amulets, others for invocations. The formulae of the amulets can be read from left to right and from right to left, with the same sequence of vowels. The second collection of formulae is built up of combinations of the seven vowels in groups of three, four, six or seven. These formulae of incantation are often of some length. É. Poirée, following C. É. Ruelle's hypothesis, gives a sufficient number of transcriptions from the papyri to permit us to study their musical structure. The following examples are taken from his article.

(4) ι α ω α ω ι ω ι α α ι ω ι ω α ω α ι

Papyrus of Paris, l. 1040.

(5) α ω ε υ η ο ι α ι ο η υ ε ω α

Ibid., l. 1183.

(6) ι η ω ο υ ε ω η ι υ ε α ω ε ι ω υ α ο η ο υ η ε ω α

υ η ι ω ε α ο ε ω ι ε ο υ α ω

Papyrus W, Leyden, p. 19, l. 14.

(1) α ε ε η η η ι ι ι ι ο ο ο ο ο υ υ υ υ υ ω ω ω ω ω ω

Papyrus W, Leyden, p. 5, l. 41, p. 14, l. 27, l. 34, p. 20, l. 19.

²⁵ Cf. Élie Poirée's article 'Chant des sept voyelles, Analyse musicale', *Congrès internat. d'histoire de la musique*, 30-7.

[illegible]

Papyrus W, Leyden, p. 2, l. 34.

(3) $a \ v \ \eta \ \iota \ \eta \ a \ \eta \ a \ \iota \ \iota \ a \ \eta \ a \ \eta \ \iota \ \eta \ \iota \ a$

Musical notation for exercise (3) on a single staff with a treble clef and a key signature of one flat (B-flat). The melody consists of eighth and sixteenth notes. Above the staff, a sequence of letters is written: a, v, η, ι, η, a, η, a, ι, ι, a, η, a, η, ι, η, ι, a. Two horizontal arrows are positioned above the letters: the first arrow points from 'a' to 'ι' and the second arrow points from 'ι' to 'a'.

Papyrus, Paris, l. 465.

We can see at once that intervals of the type found in nearly all the transcriptions are not to be found in any music from which these melismata would be likely to derive, neither in Jewish, Syriac, nor Greek music. In fact, these melismata are so different from anything we should expect that it is difficult to see how anyone could have thought of accepting the transcriptions as a basis for further discussion. Even if the deductions drawn from the passages of Nicomachus's *Introduction* had left any doubt, the musical examples should make it clear that the discussions on the music of the spheres and the connections between tones and vowels are purely symbolical. They have no reference to the domain of music proper, *i.e.* to music which can be perceived with our human senses²⁶. We can therefore dismiss Ruelle's hypothesis as an erroneous interpretation both of the theoretical treatises on which it is based and of the formulae of incantation.

E. Werner ²⁷ recently drew attention to the connection between the importance of the number eight in Gnostic writings and the introduction of the system of the eight modes on which not only classical Greek, but also Byzantine and Western Medieval musical theory is based. Here we leave the field of cosmological speculations and enter that of calendaric observations which influenced the structure of Eastern liturgies. With great perspicacity, E. Werner pointed out that the *Octoëchus*, the liturgical book of the Eastern Churches in which the hymns for the cycle of eight consecutive Sundays are arranged in accordance with the eight modes, is a remnant of a calendaric system, consisting of forty-nine plus one days, which can be traced back to 'the Sumerians, Akkadians and other ancient nations of West Asia')⁸. It has survived in Jewish liturgy and was first introduced into Eastern Christian

²⁶ The same view is expressed by K. Wachsmann in his 'Untersuchungen zum vöregorianischen Gesang', *Veröffentl. d. gregor. Ak. zu Freiburg i. d. Schweiz*, xix, 24-34. He points out that no reference has been found to the use of melodies as amulets, whereas it is known that groups of vowels were used.

²⁷ E. Werner, 'The Origin of the eight Modes of Music (Octoechos). A study in Musical Symbolism'. *Hebrew Union College Annual*, xxi (Cincinnati, 1948), 211-55.

²⁸ *Ibid.*, 23-24.

liturgy for the period between Easter and Pentecost. The Octoëchus, of Severus of Antioch, a monophysite monk who lived in the first half of the sixth century, consists of hymns for the Common of the Seasons which are sung on each of the eight Sundays in a different *ēchos* (mode), viz. on the first Sunday in the first *ēchos*, on the second Sunday in the second, and so on. These eight Sundays comprise a period of fifty days, a Pentecontade. Originally the hymns of the Octoëchus were sung on the eight Sundays after Pentecost ²⁹, but soon three other Pentecontades were added on which the hymns arranged in the eight *echoi* were sung, and finally the custom of singing the hymns in cycles of eight weeks on all the days of the week was introduced in the Eastern Churches ³⁰.

Putting together the material now available, E. Werner has shown that the liturgical practice of the Octoëchus has its origin in a calendaric system which uses a period of seven weeks plus one day as a unit and builds up the year 'of seven Pentecontades plus fourteen intercalated days. The origin of the Pentecontade Calendar rests with the conception of seven seasons and seven winds. Each wind corresponds to a God. Over these seven Gods there ruled a supreme deity ³¹'. This is the *Ogdoas*.

In the so-called 'Eighth Book of Moses', or 'Moses' Book about the Great Name' from the Papyrus Magicus Leyden W, pp. 16 sqq. ³², the anonymous author informs the adept that he will bind him by an oath to keep secret the content of its revelations, for he will soon realise what magic power the book possesses :

Ἐναπόκειται γὰρ αὐτῇ τὸ κύριον □ (ὄνομα) ὃ ἐστι Ὁκδοος (Ὁγδοάς),
ὃ τὰ πάντα ἐπιτάσσει καὶ διοικεῖ· τούτῳ γὰρ ὑπετάγησαν ἄγγελοι,
ἀρχάγγελοι, δαίμονες, δαιμόνισσαι, καὶ πάντα τὰ ὑπὸ τὴν κτίσιν·

(Stored up in it is the supreme name, which is Ogdoas, who commands and administers the whole ; to him are obedient the angels, the archangels, the demons and demonissae and everything under creation.) p. 16, ll. 46-9.

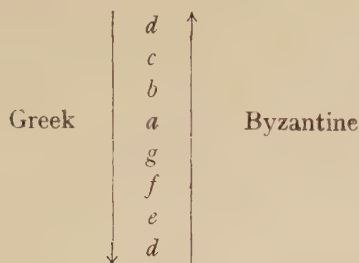
Until recently the eight *echoi* in Byzantine music had been identified by modern scholars with the eight modes of ancient Greek musical theory. This was a mistake, because the Greek 'scales'—if we are permitted to use the term—were reckoned from the highest note downwards, whereas the Byzantine theorists built up the modes from the lowest note upwards :

²⁹ Cf. A. Baumstark, *Festbrevier und Kirchenjahr der syrischen Jakobiten* (Paderborn, 1910), 26, 44.

³⁰ The name *Octoëchus* is properly used only for the liturgical book which contains the hymns, arranged in cycles of the eight modes for Sundays ; the book which contains hymns for the whole week is called *Paraklētikē* ; but the first is also called 'the lesser Octoëchus', and the second 'great Octoëchus'.

³¹ E. Werner, *op cit.* p. 223-4.

³² C. Leemans, *op. cit.* tom. ii, 139 sqq.



The essence of a melody sung in one of the eight ēchoi, however, was its musical content. By analysing the musical structure of the melodies belonging to one of the eight echoi I found that the melodies of each échos were built up of a number of formulae which were a peculiar feature of the mode³³, or, in other words: it was not the 'scale' which was the basis of composition for the early Christian and Byzantine hymnographer, but a group of formulae which belonged together and made up the material for each mode. The composer's task consisted in adapting these melodic formulae to the words of a new hymn and in linking them together in accordance with the words.

This principle can be found as the basis of musical composition everywhere in Western Asia and down to India where the Râgas or melody types which represent different moods are depicted in miniatures as gods and goddesses. It remains to be seen whether further research will show that the musical formulae which constitute the material for each mode originally had a certain ritual significance, so that they could only be sung at certain times of the year or day. We may suspect that this was the case from the fact that the melodies of the third plagal mode, the *Barys*, or grave mode, are used primarily for hymns of a mournful character, and, as the name indicates, which had to be sung in a slow tempo. This question, however, cannot be settled until we know more about Early Byzantine and even Early Christian music, since the feeling for the peculiar character of the different modes has completely vanished in Byzantine music of the period from which we have the earliest specimens of musical notation.

(b) *Greek Alchemists on Music.*

In the second book of the treatise *de magna et sacra arte* ascribed to Stephanus of Alexandria who was public professor at the time of the emperor Heraclius (610-41)³⁴, at the beginning, there is a short passage which refers to music.

³³ Cf. E. Wellesz, *A History of Byzantine Music and Hymnography*, pp. 269-87, and pp. 320-9. The fact that the melodies of the Eastern Church were built up from a certain number of melodic formulae which gave the mode its peculiar character was first expounded by the present writer in a study on 'Die Struktur des serbischen Oktoëchos', *Zeitschrift für Musikwissenschaft*, ii (1919-20), 140-8.

³⁴ Cf. F. Sherwood Taylor, *The Alchemical works of Stephanos of Alexandria*, Part I, *Ambix*, i (1937), 117. The treatise *de magna et sacra arte* has been edited by I. L. Ideler in *Physici et medici Graeci minores*, ii, Berlin, 1847, 203 sqq.

Speaking of 'the multitude of numbers compounded together' which had its existence 'from one atom and natural monad', Stephanus compares the relation of the emanating but immutable and unmoved monad with the rhythmical sound produced by Orpheus on a stringed instrument, so that the harmonious sounds 'should re-echo the co-ordinated movement of the elements and the sounding melody should be harmoniously perfected. For from the one instrument the whole composition takes its origin' ³⁵.

Here reference to music is only made in order to show the relation of one element, the single musical instrument, to the multitude of sounding elements, but it is significant of the Neo-Platonic attitude of the author that in the second paragraph of his treatise he already introduces music as an analogy to his statement, made in the first paragraph, that 'the symbol of every circular sphere is the centre, likewise of every triangle and plane and solid figure set out by lines' ³⁶. Music, for Stephanus, comes next to geometry; it forms part of the *quadrivium* which can be traced back to Pythagorean philosophy.

Musicologists have recently drawn attention to two sections on music: one in a treatise ascribed to Zosimus of Panopolis, an author of the third or fourth century A.D., the other in one ascribed to an anonymous writer of the seventh century, who was supposed to have given an augmented version of Zosimus's treatise. The sections in question form part of two chapters on music and alchemy published by M. Berthelot and C.-É. Ruelle in their *Collection des anciens alchimistes Grecs* (Paris, 1887-8). It was assumed that in them the first traces of a Byzantine musical theory are to be found ³⁷. Recent investigations by O. Gombosi in his 'Studien zur Tonartenlehre des Mittelalters' in *Acta Musicologica*, xii (1940), 29-52, however, have proved that both chapters belong together and form a short treatise, written for the purpose of comparing the elements of alchemy with those of music. In this study Gombosi has shown that owing to a lacuna in the text of the MS. from which Cod. Bibl. Nat. Paris. gr. 2327 (A) was copied, the final pages of Zosimus's treatise *πρὸς Θεόδωρον κεφάλεια* (*Coll.* iii, 43, pp. 215-18) and the beginning of the next, 'On the making of Gold' by an anonymous author (*Coll.* iii, 44, pp. 219-20), were put together. The editors of the *Collection*, though acknowledging the corrupt state of the text, overlooked the fact that the chapter on music was not the work of Zosimus, but of an anonymous author, whose treatise was appended to Zosimus's *πρὸς Θεόδωρον*. Gombosi points out that the editors of the *Collection* could have observed this from the study of the oldest manuscript which contains a group of alchemical treatises, namely the eleventh century

³⁵ Translation by F. Sherwood Taylor, *op. cit.*

³⁶ *Ibid.*, p. 27.

³⁷ C. Hoëg, 'La théorie de la musique byzantine', *Revue des Études grecques*, xxxv (1922); A. Gastoué, 'Über die 8 Töne', *Kirchenmusikalisches Jahrbuch*, xxv (1930); K. Wachsmann, *op. cit.*, 55-77. A survey of investigations into the passage of music in alchemical treatises is given in G. Reese's *Music in the Middle Ages* (1940), 85-6.

Codex Marcianus 299 (M) of the Marciana in Venice containing the end of Zosimus's *πρὸς Θεόδωρον* and the complete treatise of the *Anonymus*. The treatise of the 'anonymous philosopher' contains, in fact, the only complete version of the text. It should not, therefore, have been published by the editors of the *Collection* in the sixth part, among the commentators (*Coll.* vi, 15, 433–41).

The content of the treatise of the 'anonymous philosopher' still offers many difficulties to our understanding, though attempts have been made to explain the most obscure passages and to correct the text. Textual criticism of the treatise has to start by explaining the main technical term used in it, viz. the rare word *στοχός*, which we find in the oldest source, the Codex Marcianus (M). The two principal sources of the other group of manuscripts, viz. the Paris MSS. Bibl. Nat. gr. 2327 (A) and 2249 (K) use the term *στοῖχος*. Though Ruelle, the editor of the treatise in the *Collection des anciens alchimistes grecs*, has left *στοχός* in the Greek edition, he has emended it into *στοῖχος* (*ligne musicale*)=ecclesiastical mode in his translation. Accepting this emendation, C. Höeg, A. Gastoué, and recently, A. Auda, developed the hypothesis that Zosimus—whom they considered as the author of the treatise—had twenty-four modes in view when he spoke of the *στοχοὶ κδ'*. The adherents of the modal hypothesis referred to a footnote to the Greek text (*Coll.*, vi, p. 434) in which Ruelle pointed out that in Codex Paris. gr. 2329 (E) *στοχός* or *στοῖχος* is replaced by *ῥῆχος*, a term occurring in Byzantine musical theory and practice for the mode of a hymn-tune. E, however, cannot be accepted by us as a source for corrections in the text, since it derives from the manuscripts of group A and was written in the seventeenth century. By substituting *στοῖχος* for *στοχός* a satisfactory interpretation of the text was made impossible. This fact was already recognized by K. Wachsmann³⁸, who suggested that *στοιχείον* (=element) should be substituted for *στοχός*. This is a considerable alteration. But recently Lagercrantz has proved convincingly³⁹ that the scribe of M wrote *στοχός* where other sources had *στοιχείον*. The main difficulties for an understanding of the text virtually disappear when *στοχός* is replaced everywhere by *στοιχείον*, which means the element, not only in alchemy, but also in music, where it is one of the four tones of the tetrachord. We shall see, however, that by this change the very elaborate and far-reaching conclusions drawn from the text of the *Anonymus* by Gastoué and Auda can no longer stand.

Let us now give a short synopsis of the text of the alchemical treatise. The anonymous author starts by explaining the nature of the mystical egg of the alchemists, which consists of four elements. Four elements, too, can be found as the constituents of music, since the elementary row, the tetrachord, is built up of four tones. There are six different kinds of tetrachords: Kentroi,

³⁸ *Untersuch. z. vorgreg. Gesang*, 61, n. 9.

³⁹ *Catalogue des manuscrits alchimiques grecs*, iv, 424.

Isoi, Plagioi, Katharoi, Aëchoi and Paraëchoi, each consisting of four tones ⁴⁰. Thus, he concludes, all music is confined to twenty-four elements of different kinds. 'There is no other possible way of building up the melodies—countless within their species—of the hymns, or benedictions, or revelations, or other parts of the divine science free of a sort of aberration and corruption and other musical calamities. The same can be found in the unique, and true supreme matter, the generation of birds' ⁴¹. But it is not only the melodies that are sung, the anonymous author continues, which are built up from the four elements, but also the music which is played on wind instruments (τὸ αὐλούμενον) and on stringed (κιθαριζόμενον). He then explains of which elements a melody can be composed and how the tetrachords can be combined without creating disorder. The same procedure has to be applied to the different stages of alchemical mixtures. Finally some wind-, stringed, and percussion instruments are enumerated, some of them familiar from classical Greek authors, others, like the Achilliakon or the Rax, difficult to indentify. Names like Nadion and Kabithakanthion seem to be corruptions of Arabic names for instruments: Nadion for Nafir=trumpet, *καριθακάνθιον ἑπτὰ δακτύλων* for *κόβουζ ἀκάνθων ἑπτὰ δακτύλων*= 'a Qupāz (a kind of cither) with seven thorns (or frets) for the fingers' ⁴².

The treatise is obviously a compilation from passages dating back to writers on alchemy of the third and fourth centuries, among whom Zosimus of Panopolis is the outstanding figure, though very little, if any, of his work is really original ⁴³. It has been proved that Zosimus was heir to the ideas of Mary and of Cleopatra ⁴⁴, two alchemical authors of the first century A.D. The passages on music of the Ps.-Zosimus may, therefore, go back to speculations on musical theory current in the days of Philo of Alexandria, and compiled by him from alchemical writings by Zosimus and later commentators, through whose works fragments from Mary, Cleopatra, and other original authors on alchemy were scattered. This view is based on the examination of a passage in the sixth paragraph of the treatise, from which it seems rather doubtful whether this 'anonymous philosopher' of the seventh century had a clear view of the musical ideas which he inherited. After stating in § 2 that twenty-four different species (τῶ εἶδει διάφορα) of elements are obtained from the four

⁴⁰ Ὡςπερ δὲ τεσσάρων ὄντων μουσικῶν γενικωτάτων στοιχείων αὐ, βου, γου, δου, γίνονται παρ' αὐτῶν τῶ εἶδει διάφορα στοιχεῖα κδ' κέντροι καὶ ἴσοι καὶ πλάγιοι, καθάροι τε καὶ ἀγχοι <καὶ παράγχοι>. *Coll.* vi, 15, § 2, 434, ll. 4–6.

⁴¹ καὶ ἀδύνατον ἄλλως ὑφανθῆναι τὰς κατὰ μέρος ἀπείρους μελωδίας τῶν ὕμνων ἢ θεραπειῶν ἢ ἀποκαλύψεων ἢ ἄλλου σκέλους τῆς ἱερᾶς ἐπιστήμης, καὶ οἷον ῥεύσεως ἢ φθορᾶς ἢ ἄλλων μουσικῶν παθῶν ἐλευθέρως. τοῦτο κἀνταῦθα ἔστιν εὐρεῖν [τὸν δυνατόν] ἐπὶ τῆς μιᾶς καὶ ἀληθοῦς κυριωτάτης ὕλης, τῆς ὀρνιθογενίας. *Coll.*, 434, ll. 7–11.

⁴² Cf. O. Gombosi, 'Studien, III', *A.M.* xii, 48.

⁴³ Cf. F. Sherwood Taylor, 'A Survey of Greek Alchemy', *J.H.S.*, 1 (1930), 119.

⁴⁴ *Ibid.*, 116 and 119.

principal elements, the author admits in § 6 the possibility of another view, viz. that the twenty-four species derived from only six, each of them consisting of four elements. But, he concludes abruptly, 'it is not fitting for us to talk about this question' ⁴⁵.

It is probable that he was an adherent of the Neo-Pythagorean School who wanted to prove the essential unity of a physical world which is different in its species. His reference to a passage from Zosimus that 'everything caused by nature is one, not in form, but in system' (ένός ὄντος τοῦ φυσικοῦ, ἀλλ' οὐκ εἶδους, ἀλλὰ τέχνης)⁴⁶, suggests such a line of thought. The content of the treatise in which the elements of alchemy are compared with those of music has to be considered as a whole. The two parts are of equal importance. The chemical processes described in this and other alchemical treatises are symbolical. The chemical directions for colouring the 'egg' ⁴⁷ stand for the magical process through which the initiate is enabled to produce the philosopher's stone, i.e. to acquire superior powers by overcoming his bodily nature and transforming himself into a higher being. Similarly the 'elements' of music do not apply to audible tones and tetrachords but to the music of the spheres and to the harmonies which create an attunement between soul and body.

The fact that some of the names of instruments appear in a corrupt form, while others are so strange that it is doubtful whether they are not pure inventions of the author, is an additional indication that the treatise could have had no connection with musical practice. This part of the treatise may have been added later in order to prove that the elementary principles on which all music is based can be applied to all musical instruments, though they vary in shape and quality of sound.

Any attempt, therefore, to establish connections between the speculations on music in the alchemical treatise and actual Byzantine musical theory should proceed with great caution, particularly as the treatise consists of various parts compiled from works spread over a period of between six to eight hundred years. To assign it to a Christian author ⁴⁸ is certainly wrong. Speaking of the hymns to be sung at the service of the divine knowledge (τῆς ἱερᾶς ἐπιστήμης), Ps.-Zosimus certainly does not refer to the Orthodox Office, but to the mystery cult of a Gnostic sect, influenced by Iranian and Chaldean ideas ⁴⁹. This becomes evident from a treatise bearing the title: 'The High Priest Komarius, the philosopher, teaches Cleopatra the divine and holy art of the philosopher's

⁴⁵ Cf. *Coll.* vi. 15, § 6, 437, l. 9.

⁴⁶ *Ibid.*, 437, l. 5.

⁴⁷ Cf. R. Reitzenstein, 'Zur Geschichte d. Alchemie u. des Mystizismus', *Nachrichten d. Kgl. Ges. d. Wiss. zu Göttingen, Phil.-hist. Kl.*, 1919, 20.

⁴⁸ Cf. A. Gastoué, 'L'Origine lointaine des huit tons liturgiques', *Revue du Chant Grégorien*, xxxiv (1930), 126 sqq.

⁴⁹ R. Reitzenstein, *op. cit.*, 20. Zosimus (*Coll.*, 114) calls the alchemical process of preparing the philosopher's stone τὸ μινθριακὸν μυστήριον.

stone'⁵⁰. This art (τέχνη) is identical with that of initiation into the mystery of the 'egg', composed of four elements, 'since it is the image of the world and contains in itself the four elements'. It is also called 'the stone which is turned by the moon', 'stone which is not stone', 'eagle-stone', and 'brain of alabaster'⁵¹.

There is one point still to be mentioned: the musical terms used by Ps.-Zosimus to designate the six tetrachords, Katharos, Plagios, Isos, Kentros, Aëchos, and Paraëchos are not to be found in any works on musical theory either by classical Greek or by Byzantine authors. In Byzantine theory the term Plagios, of course, commonly designates subsidiary species of the four authentic modes, but there is a fundamental difference between these modes and the rows of tones mentioned by Ps.-Zosimus. All the Byzantine modes are based on ascending scales. The difference between authentic and plagal modes is to be found in their cadences. On the contrary, of the six tetrachords mentioned by Ps.-Zosimus, three (Kentros, Katharos, Paraëchos) are ascending, the other three descending⁵².

From all these considerations we may conclude that the treatise 'On the making of Gold' is a document of some value for our studies. More importance, however, may be attached to the blending of Greek cosmogonic speculations with ideas appertaining to Gnostic and other mystical sects, than to its reference to the theory of music. In fact, the allusions to music are incoherent to such a degree that it is easy to see that they were given by the author only as illustrations of the alchemical process, which he described to the initiates. These allusions are kept obscure in the same way as the descriptions of the alchemical process itself. References to musical theory are based on Greek musical thought; they do not show any development characteristic of Byzantine musical theory, the beginnings of which are still concealed from us. The treatise of the 'anonymous philosopher' forms a link in the chain of other alchemical works of a similar character, extending from the earliest days of a Christian society existing in the midst of a pagan majority, to the time when Orthodox Christianity had been fully developed, and had given to the Eastern Empire the features characteristic of the new Byzantine civilization.

⁵⁰ *Catal. des MSS. alchimiques grecs*, iv, 400-1.

⁵¹ Τὸ ᾧδὸν ἐκάλεσαν τετράστοιχον διὰ τὸ εἶναι αὐτὸ κόσμον μίμησιν, περιέχον τὰ τέσσαρα στοιχεῖα ἐνᾷαυτῳ· ὃν καὶ λίθον ἐκάλεσαν ὃν κυλίει ἡ σελήνη, καὶ λίθον τὸν οὐ λίθον, καὶ λίθον ἀετίτην, καὶ ἀλαβάστρινον ἐγκέφαλον. *Coll. d. anc. Alchim. gr.* i, 4, 20-1.

⁵² O. Gombosi, 'Studien III', *A.M.* xii, 49.

REVIEW.

Metallurgy in Antiquity. A Notebook for Archæologists and Technologists.

By R. J. FORBES. Pp. 489; 98 illustrations. E. J. Brill: Leiden, 1950. 41s.

THIS very readable book takes us through the present-day knowledge of the production and uses of metals in antiquity. Although Egypt, Mesopotamia and the Near East, Greece and Rome claim most of the story, the Far East and also other European places come in for some attention. A final chapter on the ways in which the archæologist could make more use of modern scientific methods is timely. Professor Forbes writes with ample knowledge and his book will rightly be considered authoritative. Although he has much to criticise in earlier efforts, he does this in a temperate and helpful way. The gaps in our knowledge are pointed out. The dating is modern and its tentative character before 1500 B.C., in view of the recent landslide in this field, is emphasised. The author's aversion to what he calls 'horrible cross references' is known, but his system of putting lists of authorities at the ends of separate chapters has its drawbacks. In the first chapter, frequent reference is made to publications by Witter, Kossina, Coghlan, etc., but these do not appear at the end of the chapter and are only to be found by the tiresome process of turning to the ends of all the chapters. The book is not free from mistakes, of which the statements that metallic antimony was never prepared in antiquity (the well-known Chaldaean vase analysed by Berthelot does not seem to be mentioned), and that zinc cannot be made without distillation (the section on zinc needs revision) may be mentioned as examples. The English is good, apart from a few lapses ('upto', 'ressemblance', 'rather unknown', 'melting' for smelting, etc.). The illustrations are often rather smudgy.

Ancient metallurgy is really primitive alchemy, and although the author does make a few tentative attempts to enter this fascinating field, his work will be somewhat disappointing to readers of *Ambix*. To the archæologist and technologist, for whom it is intended, it should be invaluable.

J. R. P.

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